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DIVERTICULA OF THE COLON*

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DIVERTICULA are blind tubes or sacs branching from cavities or canals, and those which are found in the walls of the colon have been classified as true or false. In the former group have been placed those in which the wall of the pouch includes all the coats of the bowel. In the latter group are those diverticula in which the wall of the pouch is composed only of mucous membrane that has burst through the muscular layers and has projected itself beneath the serosal surface, which serves as the second covering. Just why the latter group of abnormalities should be considered false diverticula is not clear. Neither thinness of their walls nor the fact that they are thought to be acquired would seem to exclude them from the true diverticula.

Another classification is that in which diverticula are divided into congenital and acquired types. Although the issue has been somewhat clouded because of lack of explicit description, it is generally understood that congenital diverticula are those which are anatomic anomalies and which form during the prenatal period of development. Acquired diverticula are admitted to be those which appear in postnatal life because of developmental defects or because of some weakness which exists in certain portions of the colon; for example, where the mesentery fails to cover the bowel, where blood vessels pierce the wall of the bowel and so forth. It is usually assumed that congenital diverticula have four coats and that those which are acquired have only two. This distinction is acceptable, but it cannot be said that it is satisfactory, because it is likely that among diverticula considered to be congenital there may be some the wall of which does not include all four coats of the bowel, and it is also possible that the wall of an acquired diverticulum may include all four coats.

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A SUGGESTED CLASSIFICATION

A satisfactory terminology is possible if others can be abandoned. However, if methods of terminology heretofore in common use are retained, the object of my suggestion will be defeated. The classification which I suggest is as follows:

Prenatal diverticula. These diverticula develop in utero and are of two types. Those of the first type form as true anomalies, and all walls of the colon are included in the walls of the sacs. Those of the second type are hernias of the mucous membrane between the developing muscular structures of the colonic wall. They lie beneath the serosa, and their walls therefore consist of mucous membrane and serosa.

Postnatal diverticula. These form after birth. They are hernias of the mucous membrane through or between muscular structures of the colonic wall. They lie beneath the serosa, and their walls accordingly consist of mucous membrane and serosa. Separation of postnatal diverticula into two types therefore depends not on their structure but on why and when they form. Postnatal diverticula of the first type form because the wall of the colon is weak between imperfectly encircling muscular structures; pressure and other physiologic processes within the colon are normal. These diverticula appear in adolescence. Postnatal diverticula of the second type form because pressure and other physiologic processes within the colon are sufficiently abnormal to force the mucous membrane of the colon through or between what would be presumed to be adequately encircling muscular structures. These diverticula appear in adult life, usually not until the fifth decade.

Etiology

The causes of that small number of diverticula which can be considered prenatal and of those which can be considered as the first type of postnatal do not need further comment here. Those forces which are responsible for development of the second type of postnatal diverticula need further elucidation. So far, no one knows exactly why and how these pouches form and why they fail to appear before middle or old age, but it may be surmised that like hernias elsewhere in the body they come when age, with its attendant wear and tear and atrophy of tissues, has thinned the muscle fibers and separated them.

The colon is nourished by blood vessels which pierce its walls, and certain parts are weak where the mesentery is attached; nevertheless, diverticula probably will not develop at these points until further weakness appears with the changes which accompany advanced years. The increased pressure of gas which normally forms within the colon, or the strain of undue physical effort, may cause no irregularity early in life, but as gray hairs appear the colon becomes more susceptible to such influences and diverticula may be the result. Therefore, these anatomic irregularities may occur not only as a result of unusual strain and so forth, but also because of the effect of normal processes on tissues which have developed abnormal characteristics.

Incidence

Anything simulating a fair appraisal of the frequency with which diverticula develop in the colon probably will never be made. No hint of their existence is ever given until they become the site of another pathologic process, and although it is impossible to determine the exact frequency with which this happens, it is likely that, in comparison with those cases in which dormant diverticula exist, the secondary pathologic development is of extremely rare occurrence. An individual may live his entire life harboring colonic diverticula, yet never become aware of their presence.

In the absence of more satisfactory methods of computing the incidence of diverticula of the colon, it has been necessary to rely on the experience of the pathologist in his routine postmortem examinations, and on that of the roentgenologist who has examined the colons of those who have had symptoms referable to the colon. Obviously the pathologist has a better opportunity than the roentgenologist to find these abnormal pouches in the colons of those who have not suffered ill effects from them. In a report of W. J. Mayo,[4] it is stated that Robertson, on the postmortem service at the Mayo Clinic, noted an incidence of diverticulosis of more than 5 per cent among persons who had died when past forty years of age. It was also learned from data of the roentgenologic service, where colonic roentgenograms were made for routine diagnostic purposes, that diverticula were present in the colons of nearly 6 per cent of the persons examined. Practically all the patients who had diverticula were more than forty years of age.

For purposes of comparison, Weber[5] has reviewed the records of 52,411 patients on whom roentgenologic examinations of the colon have been made at the Mayo Clinic. Diverticula were found in examination of 3137, an incidence of 5.9 per cent. None of these figures have any value in determining the incidence of diverticula, except among those persons who consult physicians for investigation of the cause of some disability.

The incidence of diverticulitis is also very difficult to determine. In one group of patients who were studied for preparation of this article and who came to operation it was as follows: of 1549 patients with diverticula of the sigmoid examined at the Mayo Clinic from 1925 to 1935, 181 (11.6 per cent) required surgical treatment. A further review of the records proves that about half those who had diverticula complained at some time of symptoms which could be attributed to inflammatory or other activity in these deformities. Telling[7] stated that 60 per cent of patients with colonic diverticula have symptoms, whereas Jones[2] wrote that in only 12 to 15 per cent of cases of diverticulosis does diverticulitis develop. Weber expressed the belief that in 15 to 20 per cent of those colons in which he was able to distinguish diverticula roentgenologically there was evidence of diverticulitis. Our experience at the clinic, in this regard, has proved that there are some cases in which there is clinical evidence of diverticulitis but roentgenologic changes are not manifest. The number of such cases is not known, however, because in many cases in which a clinical diagnosis of diverticulitis is made proof of the existence of the condition is lacking.

Anatomic Situation

Although diverticula may occur in all segments of the colon, the left half has been reported by all investigators to be the commonest site, and our experience at the Mayo Clinic confirms that of others. In fact we have found that in practically all cases in which colonic diverticula are found the sigmoid is invaded. Moreover, diverticulitis is seldom found elsewhere than in the sigmoid or immediately adjacent to it. This can be explained by the prevalence of diverticula in

the sigmoid, the fact that the lower part of the sigmoid and the upper part of the rectum often are not covered by the serosal coat and the fact that patients who have diverticulitis are usually constipated and hence the rectum is usually full. In such cases the full brunt of the pressure of muscular hyperactivity as well as that of accumulated gas is exerted in the segment immediately above the blockaded outlet, and it is in that segment that the blowout is most likely to occur. The use of cathartics and of mechanical methods to stimulate evacuation adds to the burden. Either of these measures may be properly employed to assist those who have diverticulitis but their improper use is commoner and is productive of trouble.

Much has been said about those portions of the circumference of the bowel in which diverticula are likely to occur, but it is doubtful if the significance of the available conclusions is worthy of the amount of time which has been given to the subject. The noteworthy factor which appears to have been established in this regard is that the deformities are more prevalent in those areas where blood vessels pierce the wall of the bowel and along the mesenteric border. A more significant observation is that any portion of the lumen of the bowel is commonly broken through to form these pouches, with the exception of that part which is augmented by the longitudinal bands as they attach themselves to the serosal surface.

Pathology

The diverticula themselves present a constricted neck at the point where they traverse the wall of the bowel, and a dilated body, which expands after the sac has passed beyond the wall of the bowel. The size of the aperture and that of the cavity of the pouch vary somewhat, although the average diameter of the former usually is about 1 to 3 mm. and that of the latter 4 to 8 mm. In unusual cases these limits are greatly exceeded. Associated with the diverticula in the sigmoid one occasionally can observe small, shallow, pit-like depressions which give the impression that while some force was producing diverticula in adjacent parts these pits, instead of actual herniations, were formed. At other points the mucosa and submucosa may traverse spaces in the muscular layers. Sometimes the protrusion fails to break through the longitudinal layer but pushes it ahead, and later the longitudinal layer may undergo disintegration from pressure atrophy. Thus is formed a diverticulum which, with its two layers, has usually been designated as of the false type, but which is in every sense a diverticulum and by no manner of reasoning can be termed anything else.

Those pathologic processes which attack diverticula of the colon are either inflammation or malignancy, and such changes rarely occur in any segment other than the region of the sigmoid.

The inflammatory disorder may develop as a result of an accumulation of feces within the diverticular sac. After this material dries out it may produce irritation of the mucosal lining of the pouch and consequently an inflammatory reaction. This may be the ordinary method of development of diverticulitis, but inflammation of the sigmoidal mucous membrane may spread into diverticula and produce the same result. Once the mucosal lining of the diverticulum becomes involved it begins to disintegrate, and ultimately ulcerous transformation may develop. These changes then extend to adjacent tissues and, as the wall of the bowel and the mesentery become involved, the products of inflammation encroach on the lumen of the bowel and, extending in the other direction, produce perisigmoiditis and mesenteritis. With increased edema and thickening, the neck of the diverticulum may become obstructed and the sac may become dilated until it ultimately ruptures. In most cases the inflammatory and hyperplastic changes produce thickening, which may become so extensive as to be palpable through the abdominal wall. With perforation, abscesses, encapsulated within the substance of the inflammatory mass, may form, or the diverticulum may adhere to other segments of the bowel, to the bladder or to other adjacent pelvic viscera and break through to form fistulas. Because of the slow process, sufficient time is usually provided for development of a protective wall of inflammatory and fibrous tissue.

Malignant changes may develop within the mucosal lining of diverticula, and because of their situation their presence may be obscured for a long time. Although the association of diverticulitis and carcinoma is infrequent, the latter condition should be suspected until it has been proved to be absent.

Symptoms

Abdominal discomfort of some type is the most constant single evidence of pathologic involvement of diverticula of the colon, and although it may appear in bizarre forms and situations, depending on the complicating factors associated, it is generally most prominent in the left lower sector of the abdomen. There may be an acute pain, similar to that of acute appendicitis. In some cases there is intermittent, piercing pain; in other cases the pain may be a dull, boring discomfort which is

almost constant. Acute attacks may be accompanied by abdominal rigidity, nausea and vomiting, with tenderness following the attack. Constipation is present in more than half the cases, but in no sense can this be considered a symptom of the disease. Of course there is an obstructive phase which occasionally assumes the proportions of an emergency, and in such cases a distinct, palpable mass is usually in evidence. Incidentally such masses, when attributable to diverticulitis, are inclined to recede, at least partially, following the acute phase, and when this does not occur one should bear in mind the possible existence of a carcinoma.

In about a fourth of the cases of diverticulitis vesical symptoms are manifest; these irregularities are attributable either to adhesion between the diverticulum and the vesical wall or to actual perforation and the formation of a fistula.

Diagnosis

Roentgenographic Examination

It may be said that roentgenology provides the most valuable single aid in establishing the diagnosis of diverticulitis and is almost the only means whereby undiseased diverticula can be discovered. The symptoms and physical evidence, both of which have been described, along with roentgenologic study, provide means of diagnosis which compare favorably with those modern methods of investigation employed in determining the nature of other disorders.

In the Department of Roentgenology of the Mayo Clinic, the outline of the colon after a barium enema has been observed roentgenoscopically instead of the barium meal's being employed, and by this method the diverticula are seen as rounded, pouch-like shadows along the contour of the bowel. With Weber's modification of the double-contrast technic of Fischer other characteristic signs are observed which increase the efficiency of the diagnosis. The inflammatory disease irritates the involved segment, and the resulting hypermotility varies with the intensity of the process. There may appear only sharp, serrated haustra, the involved segment of bowel may present a somewhat narrowed lumen, or extreme occlusion may be observed. These deformities may manifest themselves as a false filling defect, owing to spastic narrowing which may become so severe as to approach complete occlusion, or an actual filling deformity produced by infringement on the lumen of the bowel by formative inflammatory developments around its circumference. One who is inexperienced may be confused because of the similarity of these irregularities to those produced by carcinoma, but if it is borne in mind that in inflammatory disease the involved segment of bowel is likely to be long and that the contours are concentric, whereas in cancer the outlines are sharply irregular and the involved segment is much shorter, much of the difficulty will be avoided.

Proctoscopic Examination

Until a few years ago this method of examination provided little of value for the diagnostician as he attempted to determine the presence or absence of superimposed pathologic states in colonic diverticula. However, experience has taught him much. Because practically all superimposed pathologic states which develop in these deformities occur in those which lie in the sigmoid, the distortion produced should in most cases be visible on proctoscopic examination. Hence a special effort has been made to discover the signs of diverticulitis that can be seen on proctoscopic examination, and five signs have been identified.

1. *Relative immobility of the bowel in a segment which is normally freely movable.* This bit of evidence alone is not sufficient to establish a diagnosis, but when coupled with other characteristic irregularities it forms strong supporting evidence. In all cases in which a patient has been found to have diverticulitis, great difficulty has been experienced in advancing the proctoscope its full length. There are other conditions, such as a short mesosigmoid, a fixed and retroverted uterus and pelvic inflammatory disease, which interfere with, or even prevent, complete proctoscopy, but these conditions also have features which aid in making the differential diagnosis.

2. *Angulation of the lumen of the bowel.* The physician may reach a certain distance with the proctoscope and find that the lumen turns sharply. This factor, along with immobility, may render further progress of the instrument very difficult or even impossible. In those cases in which we at the clinic have been able to insert the proctoscope farther we have observed additional features.

3. *Reduced lumen and mucosal folds.* This reduction of the lumen of the bowel is characteristic, and its appearance at once makes it clear that the contracture is owing to some influence which squeezes the wall of the bowel and produces the mucosal folds, as the lining membrane is crowded together. A little added pressure is often necessary in order to force the proctoscope ahead, and as this is accomplished it can be seen that the stricture smooths out somewhat and the folds of mucosa are partially obliterated. It should be stated that it is not always possible to complete this examination with a proctoscope of average

dimensions, and often, even when an instrument of much smaller caliber is employed, the examiner must admit defeat. In these cases, however, information is often gained which is sufficient to substantiate a diagnosis which until that time was only tentative.

4. *Sigmoidal sacculation.* This peculiarity is normally observed in a mobile sigmoid which gives no evidence of perisigmoidal inflammatory disease, and usually, when it is discovered, if diverticula are seen on roentgenologic examination they are as likely to be dormant as they are to be producers of symptoms. The frequency with which diverticula are discovered in roentgenograms of patients who harbor them is striking. They appear as shallow pouches which may extend partially around the wall of the bowel, or which involve its entire circumference, and they are separated by diaphragmatic or ridge-like elevations across the lumen of the bowel. These valve-like arrangements are elastic. They do not limit the lumen permanently or interfere materially with advance of the proctoscope, and they can be distinguished from spastic contracture by their failure to disappear.

5. *Seeing the diverticula.* Whereas this is the most valuable single diagnostic sign it is rarely possible to see the diverticula in a case of active diverticulitis. Diverticula are seen most frequently when there is no associated inflammatory disease. They appear as small openings in the mucosa of the bowel, and offer one of the strongest arguments against the use of inflating devices during proctoscopy. The diameter of the lumen of these mucosal openings averages 2 to 3 mm., and often fecal concretions can be seen projecting from them.

One might suspect that some evidence of irritability or spastic activity would be observed in this condition, but when it is realized that rarely is there any associated inflammatory disease of the sigmoidal mucous membrane, absence of this evidence can be understood. The one important condition from which diverticulitis must be distinguished is malignant disease, and often there is no basis for suspicion that cancer is present except the finding of blood in the stool. This is because it is rarely possible to reach with the proctoscope the upper limit of the diseased portion of the bowel, and whereas malignant features may not be observed in examination, so far as it has been carried, still it is not justifiable to report on the condition of the segment which has not been seen. When a patient gives a history of bleeding, and it is impossible to find adequate reason for it, the physician is justified in suggesting the possibility of cancer. However, when hemorrhoids or other probable sources of blood are found, the value of the findings is greatly diminished and it can be reported only that cancer or hemorrhoids are present, or possibly both.

Treatment

Some investigators have been prone to regard inflammatory disease of diverticula as they have similar disease of the appendix, and forthwith have proceeded to treat the former as they treat the latter. They believe that with the appearance of acute symptoms surgical measures are immediately indicated. I think that a more conservative attitude should be observed. Sigmoidal diverticula do not swing free into the abdominal cavity as does the appendix, and experience has proved that rupture of diverticula, with resultant general peritonitis, rarely occurs. With periodic inflammatory attacks, these sacs become enmeshed in a hyperplastic mass of diseased and reparative tissues; this reduces the possibility of extension of the process to the abdominal cavity and renders formation of localized abscess more likely.

W. J. Mayo[4] advised that when an abscess forms the pus be evacuated by incision instead of waiting for its spontaneous discharge, because the latter course may eventuate in fistula with its attendant evils. He expressed the belief that if more radical treatment should be indicated it could be postponed to a later and more favorable time, and recommended that if obstruction should develop colostomy be performed as close to the region of obstruction as convenient. In this manner, the stenosed portion can later be resected along with the colostomy opening, through the same incision. Mayo also asserted that in some cases "colostomy may be resorted to for temporary relief, and the opening in the colon closed later, if the infective process regresses spontaneously sufficiently to restore the lumen of the colon." With such a provision it may be possible to institute treatment with hot enemas or through-and-through hot irrigations, with a catheter inserted in the distal segment of the bowel as a means of bringing about the recession more satisfactorily. Recently I have employed the Elliott treatment, using special applicators for the rectum, but my experience thus far has been too limited to allow me to venture an opinion as to its value. In a former publication[1] it was advised that indications for surgical operation be considered to be acute perforation, abscess, fistula (external, vesical, intestinal or multiple), inflammatory obstruction and cancer.

When none of these complicating circumstances

arise, medical management and treatment of a conservative type are preferable. Patients should be confined to bed and placed on a diet free from residue. Hot irrigations (110°F.) should be used rectally. Ice bags should be applied to the left lower part of the abdomen. Often it will be found that acute symptoms are reduced in a short time, and after this a bland anticonstipation diet can be substituted. If there are any obstructive difficulties, mineral oil in small doses should be given, but if this feature is absent the oil need not be used. Antispasmodic drugs are of doubtful value. A patient should never cease to regard his problem seriously, and it will always be necessary for him to be careful about his diet and his intestinal habits. In some cases he may avoid trouble permanently, but in other cases calamity may occur and require operative interference. If patients are so situated that skilled surgical attention is available, there is no reason why they should not care for themselves, under a physician's guidance.

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HYDATIDIFORM MOLE AND CHORIONEPITHELIOMA

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ALTHOUGH not a common condition, hydatidiform mole is sufficiently frequent so that most obstetricians encounter it occasionally. This pathologic entity is one in which the placenta is converted into a mass of grape-like bodies resembling hydatid cysts. These cysts, which vary greatly in size, represent a cystic degeneration of the stroma of the villi. In addition there is usually a marked proliferation of the epithelial layers of the villi. The danger from hydatidiform mole lies in its tendency to severe hemorrhage and its potential malignancy.

A group of 12 cases of hydatidiform mole in which hormone and pathological studies have been done has been investigated. In 2 of these the condition developed into malignant chorionepithelioma. This gives an incidence of 16 per cent, as compared with the generally accepted figure of 15 per cent. As usual, all the cases were admitted to the hospital from the second to sixth month of pregnancy. In only one third was the uterus sufficiently enlarged beyond its expected size to be clinically noticeable. All the patients entered the hospital because of bleeding, usually of several weeks' duration. In 2 cases the hemorrhage was so severe following the delivery of the mole that the uterus had to be packed and the patient transfused. There have been no deaths in this series, but 1 of the patients with chorionepithelioma is now in the hospital with pulmonary and brain metastases and the prognosis is hopeless.

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The statement which is frequently made that signs of toxemia are often present in this condition did not seem to hold true in this series. Severe nausea with considerable vomiting was present in 5 of the cases. There was no case with a systolic blood pressure of over 120. Edema that was sufficiently marked to appear in either the history or the physical examination occurred in only 1 patient. The urine reports on the cases with catheter specimens were essentially negative. No other manifestations of toxemia were recorded.

TABLE 1.

CASE NO.	DURATION OF PREGNANCY	TOTAL URINARY PROLAN	FIRST NEGATIVE ASCHHEIM-ZONDEK TEST
	mo.	*r. u.*	*wk.*
1	2½	200	2
2	4	25,000+ 25,000 (mole)	2
3	2	200	4
4	5	4,000	3
5	3	500 1,000 (mole)	2
6	6		2
7	3	1,000+	4
8	5	2,500 2,500 (mole)	3
9	3	25,000 (mole) 5,000 (corpus luteum)	2
10	5	200	2
11*	3	10,000+	6†
12*	3	500 (at operation)	None

*Chorionepithelioma.
†After hysterectomy.

It is generally believed that there is an increase in the amount of urinary prolan in this condition. We found this to be so in 7 cases, including one of the cases that became malignant (Table 1). The remaining 5 cases, including the

other malignant one, showed a normal or low amount of prolan in the urine. There is a peak at about six weeks in normal pregnancy when large amounts of prolan are excreted. This production drops off very rapidly, and by the time moles develop a high value is abnormal. The amount found corresponds roughly to the amount of active trophoblastic cells in the placenta or mole. A mole with cystic villi and with slight trophoblastic proliferation gives a low titer, while one with more trophoblastic tissue gives a higher one. The activity and amount of trophoblastic tissue is not necessarily related to its malignant potentialities. Some of the highest titers were obtained in moles that were benign, and one of the moles that became malignant had a very low titer. Once a mole has become malignant and invasion has begun, the hormone titer usually rises as the disease spreads. It is therefore extremely important that surgery be employed while the titer is still low.

While the commonest method in following these cases is the titration of prolan in the urine, a study of the extracts of the mole and other tissues is of scientific interest. The amount of prolan recovered from the mole tissue corresponds very closely to that recovered in the urine. In one case a large amount of prolan, 5000 r.u. (rat units), was found in a corpus luteum cyst. In another case, which was seen only at autopsy and therefore is not included in this series, an extremely large amount of prolan, 10,000 r.u., was extracted from a lung metastasis.

From the clinical point of view it is extremely important to determine the onset of malignant invasion. Unfortunately, we are as yet unable to determine by microscopic sections of a mole whether it is potentially malignant. There are no histological criteria on which such a conclusion can be based. The amount of trophoblastic and syncytial proliferation, the number of mitoses and the maturity of cell types do not seem to answer the question, and the sections of a mole that became malignant were called benign by several pathologists. The only definite proof of malignancy is the actual finding of invading fetal cells in the uterine wall and its blood vessels. This of course is impossible without a section obtained by hysterectomy. However, hormonal determinations may give a fairly accurate diagnosis.

In following the cases in this series, weekly Aschheim-Zondek tests were done. Eight of the benign cases had a negative test at the end of two weeks after delivery of the mole. In 2 others the test was negative by the end of four weeks. Since there was no benign case which stayed positive over four weeks, it would seem that a positive test after a month is suggestive of malignant degeneration.

In the first of the 2 malignant cases the patient, a seventeen-year-old white girl, was three months pregnant by dates. Her uterus was the size of a five months' pregnancy, and she had been staining for two months. A titration of her urine showed a large amount of prolan, 10,000 r.u. She was delivered of a large mole, following which Aschheim-Zondek tests remained positive for six weeks. The test at this point showed only 166 r.u. of prolan. She was not bleeding but a diagnostic dilatation and curettage was done, which was negative. Because of her positive Aschheim-Zondek tests a hysterectomy was performed. A solid, malignant chorionepithelioma about 3 cm. in diameter was found deep in the uterine wall and invading a large blood vessel. Six weeks following the operation the Aschheim-Zondek test was negative. It is now two years since the operation, and negative tests have continued.

The other case of malignancy had been delivered three months previously of a hydatid mole at another hospital. When she appeared at our clinic she was staining. An Aschheim-Zondek test showed 500 r.u. of prolan per liter of urine. Curettings were obtained that were diagnosed chorionepithelioma. A hysterectomy was done and a malignant tumor was found deeply invading the uterine wall and blood vessels. The Aschheim-Zondek test has remained positive, and now, one year from operation, the patient is in the hospital with metastases in the lungs and brain.

The importance of early surgery is well shown by the two cases described. Any hope for the patient's recovery depends on removing the tumor at the earliest possible moment. The presence of a positive Aschheim-Zondek test six weeks after the delivery of a mole is sufficient indication for surgery.

SUMMARY AND CONCLUSIONS

A study of 12 cases of hydatidiform mole has been carried out. Two cases developed chorionepitheliomas. Pathological study does not as yet give us definite criteria of potential malignancy in the mole. The urinary prolan is often high in this condition, but in some cases it is low. In all the benign moles the Aschheim-Zondek test was negative within four weeks of the delivery of the mole. The presence of a positive test following this interval is suggestive of malignant degeneration.

It can be concluded that, while a high urinary prolan may indicate a hydatidiform mole, a low prolan does not rule it out, that all cases with benign moles should have a negative Aschheim-Zondek test within four weeks after delivery and that a positive Aschheim-Zondek test six weeks or longer after passage of a mole indicates the need for surgical intervention.

THE USE OF PAREDRINE TO CORRECT THE FALL IN BLOOD PRESSURE DURING SPINAL ANESTHESIA*

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A MARKED fall in blood pressure is frequently encountered during spinal anesthesia. A variety of pressor drugs have been employed to correct or prevent this fall, including epinephrine, ephedrine,[1] Neosynephrin[2] and amphetamine (Benzedrine).[3]

Paredrine,§ a drug recently introduced, has a powerful pressor action due to stimulation of the smooth muscle of the arterial wall,[4] and is effective when given by mouth, intramuscularly or intravenously. Good pressor effects are obtained with 20 or 30 mg. orally, 10 or 20 mg. intramuscularly and 5 or 10 mg. intravenously. These results suggested that the drug might be useful in correcting the fall in blood pressure observed during spinal anesthesia. The purpose of the present communication is to report the results obtained with Paredrine.

MATERIAL AND METHOD

Fifty patients in whom a rapid, marked fall in blood pressure occurred during spinal anesthesia were studied. All but 2 had abdominal operations; these exceptions had amputations of a lower limb. The drugs used to induce spinal anesthesia were novocain, in doses of 75 to 150 mg., and Nupercaine, in doses of 10 to 20 cc. of a 1:1500 solution. In 5 cases (Table 1), 48 or 96 mg. of ephedrine was given intramuscularly before the introduction of the anesthetic drugs into the subarachnoid space. Measurements of pulse rate and blood pressure were made every five minutes; when the latter fell markedly, Paredrine was administered in doses of 10 to 20 mg. intramuscularly or 5 to 10 mg. intravenously, or both. Measurements of the pulse and blood pressure were made every five minutes. The rise in blood pressure was considered satisfactory if the systolic pressure was maintained above 100.

RESULTS

In every case, the administration of Paredrine was followed by a return of blood pressure to a satisfactory level. The pressure usually began to rise within five minutes after the intramuscular injection of 10 mg. of the drug; if no rise was noted at this time, a second injection of the same dose was given. This invariably secured the desired result. The blood pressure was maintained at a satisfactory level for half an hour to over two hours following the intramuscular administration of Paredrine. Following intravenous injection a rise in blood pressure was detectable in

TABLE 1. *Effect of Paredrine on Blood Pressure during Spinal Anesthesia.*

CASE NO.	DOSE	BLOOD PRESSURE BEFORE ANESTHESIA	BLOOD PRESSURE DURING ANESTHESIA	BLOOD PRESSURE AFTER PAREDRINE	DURATION OF SATISFACTORY EFFECT
	mg.	*mm.*	*mm.*	*mm.*	*min.*
1	10 I.V.	155/85	70/40	150/80	20
2	8 I.V.*	140/80	70/50	200/100	50+
3	10+10 I.M.	105/60	60/40	100/60	45+
4	20 I.M.	120/60	80/50	210/100	70
	10 I.M.		60/40	160/80	90
5	10 I.M.	160/80	80/50	160/80	35+
6	10 I.M.	120/70	30/0	150/80	50
	20 I.M.		60/30	145/70	35+
7	10 I.M.	100/60	70/50	120/70	35
	5 I.V., 15 I.M.		60/40	120/60	60+
8	10 I.M.	100/60	65/40	120/85	55
	10 I.M.		80/50	120/80	55+
9	5 I.V., 10 I.M.	120/80	0	250/120	100+
10	10+10 I.M.	130/70	70/40	130/70	90
11	10 I.M.	110/70	70/40	140/40	125+
12	10 I.M.	110/60	50/30	120/70	60+
13	10 I.M.	130/80	60/40	160/60	60+
14	10 I.M.	110/70	40/10	120/60	80+
15	10 I.M.*	140/80	100/60	170/80	50+
16	10+10 I.M.	200/110	70/40	240/140	50+
17	10 I.M.*	125/100	50/0	165/80	85+
18	10 I.M.	100/60	40/0	100/60	30+
19	10+10 I.M.	120/60	80/50	115/70	55
20	10 I.M.	100/60	0	100/60	20+
21	10 I.M.	130/70	80/60	170/100	55+
22	10 I.M.	125/80	50/0	130/75	50+
23	10 I.M.	130/80	0	120/80	50+
24	10 I.M.	110/60	70/30	100/40	40+
25	10 I.M.	120/60	70/50	140/80	80+
26	10 I.M.	90/60	60/40	120/60	30+
27	10 I.M.	120/80	80/60	110/70	30+
28	5 I.V., 15 I.M.	100/60	0	100/60	35+
29	5 I.V., 15 I.M.	110/60	0	230/100	70+
30	10 I.M.	120/60	70/40	150/80	80+
*31	10 I.M.	100/60	70/40	170/80	40+
32	10 I.M.	110/60	70/40	110/70	40+
33	10 I.M.*	120/70	60/40	120/70	40+
34	10 I.M.	120/60	50/20	160/70	30+
35	10 I.M.†	100/60	50/10	100/60	30
	10 I.M.		50/30	110/60	40+
36	10+10 I.M.	100/60	70/40	130/50	90
37	10 I.M.	140/60	90/50	140/60	50+
38	10 I.M.	100/40	70/40	150/85	60
39	10 I.M.	100/70	70/20	110/50	35+
40	10+10 I.M.	115/40	40/20	140/65	55+
41	10+10 I.M.	120/80	0	180/85	85+
42	10+10 I.M.	160/100	80/60	170/80	40+
43	10+10 I.M.	130/60	80/50	170/90	40+
44	10 I.M.	100/50	70/50	120/60	55+
45	10+10 I.M.	130/60	70/50	150/60	45+
46	10 I.M.	120/60	90/50	150/70	80+
47	10 I.M.	135/70	70/50	140/70	30+
48	10+10 I.M.	100/40	40/0	110/50	35+
49	5 I.V., 10 I.M.	120/70	0	140/70	65+
50	10 I.M.	120/70	80/40	125/65	30+

*Received 48 mg. ephedrine intramuscularly before spinal anesthesia.
†Received 96 mg. ephedrine intramuscularly before spinal anesthesia.

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§Paredrine, available as the hydrobromide, is *p*-hydroxy-*a*-methyl-phenylethylamine hydrobromide. It was kindly supplied to us by Smith, Kline and French Laboratories, Philadelphia.

two or three minutes and lasted from twenty to fifty minutes. There was no correlation between the response to the injection of the drug and the body weight, the dose of anesthetic or the level of anesthesia in the patient. Changes in pulse rate were variable; usually a return occurred to levels obtaining before induction of spinal anesthesia irrespective of whether the fall in blood pressure resulting from the anesthesia was associated with tachycardia or with bradycardia.

No untoward symptoms were observed. In 5 cases in which the blood pressure fell in thirty to seventy minutes after the injection of Paredrine, a second injection was required to maintain the pressure at a satisfactory level until the operation had been completed.

DISCUSSION

The data clearly demonstrate the value of Paredrine in correcting the fall in blood pressure observed during spinal anesthesia. As a result of experience with the 50 cases here reported, the procedure for the use of the drug has been standardized as follows:

When the systolic pressure falls markedly, but not below 50, 10 mg. is given intramuscularly. If no rise occurs within five minutes, a second injection of 10 mg. is given intramuscularly. If the systolic pressure falls below 50, 5 mg. is given intravenously. When the systolic pressure has again fallen below 100, usually in fifteen or twenty minutes after intravenous injection, 10 mg. is given intramuscularly.

In addition to the above reported cases, Paredrine has been successfully used in 3 cases of marked fall in blood pressure due to novocain, given subcutaneously, and in 1 case with a fall in blood pressure due to Avertin anesthesia.

Paredrine has certain advantages over other pressor drugs heretofore used in correcting or preventing the fall in blood pressure during spinal anesthesia. Epinephrine has only a transitory pressor effect; moreover this drug causes a marked tachycardia and predisposes to the development of cardiac arrhythmias. Amphetamine (Benzedrine) has a marked stimulating effect on the cortical centers. Ephedrine has a similar, though less marked, cortical action and, in addition, may cause tachycardia. Paredrine does not cause the cerebral hyperactivity such as is seen following the administration of amphetamine or ephedrine. It also differs from epinephrine and ephedrine[5] in that it has little or no direct stimulating action on the heart, all or most of its action being peripheral.[4, 6] In normal subjects no change in the output of the heart occurs in association with the rise in blood pressure which follows the administration of Paredrine.[6] Data bearing on the effect of the injection of Paredrine on cardiac output in patients during spinal anesthesia are not yet available; such data are essential for a complete understanding of the action of the drug.

Some anesthetists prefer to give pressor drugs before the induction of spinal anesthesia in order to prevent a fall in blood pressure. Paredrine, in 10-mg. doses given intramuscularly, has been used in this manner in approximately a dozen cases thus far. In most of these it prevented a fall in blood pressure. In an occasional case it merely delayed it; a second injection of 10 mg. of the drug was, however, successful in restoring the blood pressure to normal.

The properties of Paredrine suggest that it might be useful in the treatment of various types of peripheral vasomotor collapse. The results in a relatively small number of cases have shown that the drug is a useful adjunct in the treatment of this condition. These and additional data will be the subject of a report at a later date.

SUMMARY AND CONCLUSIONS

Paredrine is useful in raising the blood pressure to satisfactory levels if it becomes unduly lowered by spinal anesthesia. The pulse rate is maintained at, or returns to, levels obtaining before the induction of spinal anesthesia. Paredrine has little or no direct effect on the heart, its direct action being apparently limited to the peripheral vessels. No untoward effects have been noted after its administration.

A satisfactory procedure in using the drug for correcting the fall in blood pressure associated with spinal anesthesia is outlined.

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ACUTE LUPUS ERYTHEMATOSUS DISSEMINATUS*

Report of a Case

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WITHIN recent years a condition that has gone under a variety of names, one of which is lupus erythematosus disseminatus, has been brought to the attention of the medical profession. On reviewing this and allied problems it is apparent that closely related states may give rise to quite different symptoms and yet eventually prove to have a common underlying mechanism. The reasons for reporting this single case are first, that one clinical feature presented was unique and for a while made the condition appear rheumatic; and second, that we wish to record the effect of radiation of the ovaries.

As early as 1871 Kaposi[1] reported this condition. Gross[2] found 37 cases in 6000 autopsies, but in only 11 was he certain of the diagnosis. In 1923 and 1924, Libman and Sacks[3, 4] described a syndrome in papers entitled "A Hitherto Undescribed Form of Valvular and Mural Endocarditis." In these reports they cited 23 cases. The essential features to which they called attention were nonbacterial endocarditis, white-centered petechiae, pericarditis, glomerulonephritis, the absence of Aschoff nodules, pleuropulmonary symptoms, a tendency to leukopenia, purpuric rashes, and eruptions of the face resembling acute lupus erythematosus. They emphasized the fact that occurrence of many of these findings was inconstant and was not uniform in the different cases. Our knowledge concerning this condition became more crystallized following the publication of papers by Baehr and his collaborators.[5, 6] Since then it has been more commonly realized that we are dealing with a generalized disease, involving many of the internal organs of the body, during the course of which skin lesions appear on the face, and which almost invariably run a subacute or chronic but fatal course. In the more recent reports[7–10] it would seem that some cases at least are included that probably do not belong to this group.

CASE REPORT

M. B. (Medical 52625), a 16-year-old girl, was born in Boston and had lived there all her life. She was a normal baby. As a child she had had whooping cough, measles and scarlet fever. Four years before entry to the hospital she had had an undiagnosed illness, at which time she was bedridden for 6 weeks and had a temperature as high as 103°F. She was subject to head colds, and had always been rather pale and not quite so vigorous as many children. During the fall of 1937 she complained of occasional headaches, which were relieved by aspirin, and also stated that her right shoulder was somewhat stiff and sore. Her mother noticed that there was some swelling and tenderness of the left wrist. These symptoms were not persistent or very severe.

In January, 1938, the patient contracted a cold with some nasal obstruction, and had fever and generalized malaise. Soon afterward she developed pains and aches in various joints and parts of the body. The fever and feeling of malaise persisted and she was seen in consultation by one of us on February 17. At this time physical examination showed a well-developed and nourished girl. The temperature was 102°F., the respirations 30, and the pulse 20. No rash was discernible. The mouth, nose and throat were normal. There was some swelling and tenderness of the left wrist and fingers of the left hand. The heart rate was rapid, the rhythm was regular, and a precordial friction rub was heard over the base of the heart. There was dullness at the base of the lungs posteriorly, with evidence of a small amount of fluid in both pleural cavities. The abdomen was normal. Electrocardiograms showed normal tachycardia and an auriculoventricular interval of 0.24 sec. The white-blood-cell count was 5300, the red-cell count 3,800,000, and the hemoglobin 75 per cent. The clinical course remained unaltered until March 1, when a rosy-red rash appeared on both cheeks and over the bridge of the nose.

The patient entered the Peter Bent Brigham Hospital on March 22, 1938. Physical examination at this time was essentially the same as previously described, with the exception of a butterfly erythematous lesion over both cheeks and the bridge of the nose. There were also some small macular, non-raised, erythematous spots on the palms of both hands. The patient continued to have a fever. X-ray films showed free fluid in the right pleural cavity. A thoracentesis was done, with the removal of 500 cc. of straw-colored fluid which was sterile on culture; the specific gravity was 1.010, and the cell count 1685 per cubic millimeter, with 1664 red cells. Blood Wassermann and Hinton tests were negative; the gonococcus complement-fixation test was positive on two occasions. The urine showed a specific gravity of 1.011, a slight trace of albumin, 8 to 10 red blood cells and 13 to 18 white blood cells per high-power field and a few hyaline and granular casts. The red-blood-cell count was 4,100,000, and the white-cell count 5400. On the 4th, 7th and 9th hospital days x-ray treatments were given to the ovaries for the purpose of sterilization; the total dose was 1630 r. The day following her last treatment the patient felt better than at any time since the onset of her illness. The temperature, which had persistently remained at 103 or 104°F., dropped suddenly to almost normal. This improvement lasted for only 2 days. The patient developed a sore throat, and the temperature rose to 103°F.; 2 or 3 days later she showed signs of pneumonia

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of the right lower lobe and a Type 3 pneumococcus was recovered from the sputum. The nonprotein nitrogen of the blood was 30 mg. per 100 cc., and the total protein 4.3 gm., the albumin being 1.9 gm. and the globulin 2.4 gm. From the time of admission there was a steady drop in the red-cell count to 2,740,000. The leukopenia persisted up to the time of the development of pneumonia, at which time white-cell counts of 10,250 and 12,900 were obtained on successive days. The urine continued to show evidence of active nephritis. The course from this time on was steadily downhill despite sulfanilamide therapy. The patient became stuporous and anorexic, developed edema, became markedly anemic and died on the 24th hospital day.

Autopsy. The body was that of a well-developed and well-nourished girl. There was very slight café-au-lait pigmentation over the bridge of the nose and both cheeks.

The peritoneum was thicker than normal throughout. On its surface could be discerned many places in which boggy edematous fibrous tissue was found. Four hundred cubic centimeters of clear, yellow fluid was removed from the peritoneal cavity. The spleen, which was large, was almost entirely surrounded by thin, delicate, edematous, fibrinous adhesions, which were readily broken by running the hands around it. No petechial hemorrhages were seen over the serosal surfaces. There were many small areas of infarction in the spleen, and microscopically there were organized thrombi in a few arterioles.

There was no free fluid within either pleural cavity. No evidence of emphysema or empyema could be found. Each lung was firmly adherent with readily broken fibrinous adhesions to the parietal pleura. The lungs showed areas of bronchopneumonia, culture from which showed a Type 3 pneumococcus.

Cultures from both mastoids yielded Type 3 pneumococci.

The pericardial cavity contained 250 cc. of clear, brown fluid. The surfaces, both visceral and parietal, were covered with abundant shaggy, fibrinous exudate. Externally the pericardium was adherent to the pleura on each side.

The heart weighed 410 gm. There was no evidence of stenosis of any of the valves, which were thin, membranous, translucent and freely movable. They showed no abnormality except for the mitral valve, around the base of each cusp of which were numerous tiny, yellowish-red vegetations which were moderately adherent to the endocardium; cultures of these vegetations yielded no growth. Over the papillary muscles on the right ventricle were many vegetations similar to those seen on the mitral valve. Microscopically there was edema of the heart muscle. There were occasional foci of degeneration of muscle fibers around small, thrombosed vessels. No Aschoff bodies were seen.

The surfaces of the kidneys were studded with small red areas measuring up to 3 mm. in diameter. Petechial hemorrhages were also seen within the parenchyma. Microscopically there was a very slight generalized hyaline thickening of the glomerular capillaries, suggesting the "wire loop" lesions of Baehr, Klemperer and Schifrin;[6] some arterioles showed intimal thickening with fibrosis.

DISCUSSION

The case corresponds quite clearly, from a clinical and pathological point of view, to what is now called lupus erythematosus disseminatus. The first point of interest is that throughout the course of the disease there was a distinct delay in auriculoventricular conduction (PR interval 0.24 to 0.26 seconds). Inasmuch as no digitalis had been given, this finding in the early course of the disease before the rash appeared led us to believe that the patient was suffering from rheumatic fever. In all previously published cases of lupus erythematosus, delay in auriculoventricular conduction was conspicuous by its absence.

The second point of interest was the attempt made to sterilize the patient as a therapeutic procedure. This was done because in our experience we have never seen a case of this type of lupus erythematosus in a man and because in all women the disease has occurred between puberty and the menopause. This sex relation has been clearly pointed out by Baehr.[5] Although there may well be very rare cases in men, the fact of an overwhelming predominance of women during the menstruating period of life led us to institute sterilization by x-ray treatment of the ovary. It was believed that such procedure is warranted once the diagnosis is established, since the outlook in this disease at present may be regarded as hopeless. It is of some interest that directly after the third x-ray treatment the temperature fell from 104 to 99°F. in forty-eight hours. It was the first time in about four weeks that the temperature had been normal; moreover, the patient felt and looked better.

A short time after the subsidence of fever, an entirely different condition developed. She showed clinical evidence of lobar pneumonia, and a Type 3 pneumococcus was recovered from the sputum. Our belief that this was not a part of the underlying condition was supported by the development of leukocytosis, which had not been present during the previous six weeks. Although the illness terminated fatally, one is perhaps justified in further attempts at cure by sterilization, unless other curative measures are discovered in the future.

SUMMARY

A case of lupus erythematosus disseminatus is reported in which delayed auriculoventricular conduction was present. This led to an erroneous diagnosis of rheumatic fever in the early stages of the disease, before the rash appeared. X-ray treatment of the ovaries was instituted as a therapeutic procedure. The temperature quickly fell to normal with temporary clinical improvement, but this was promptly followed by a Type 3 pneumococcus pneumonia, which ended fatally.

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PAPERS FROM THE FAULKNER HOSPITAL

CASE RECORDS OF THE FAULKNER HOSPITAL

Antemortem and Postmortem Records as Used in Monthly Clinicopathological Conferences

Directed by J. Beach Hazard, M.D.

CASE 6388

Presentation of Case

A sixty-two-year-old American housewife was admitted with the complaints of nausea, vomiting and abdominal discomfort.

Three days before admission she became nauseated and shortly afterward vomited. At the same time she began to notice a vague discomfort around the umbilicus. In the evening, however, she felt better and was able to sleep well throughout the night. The following day nausea and vomiting recurred. There was no pain. Vomiting attacks persisted throughout the remainder of the time preceding entry. On the day the attacks began she had had two normal bowel movements but no others before admission.

Twenty-nine years before admission she had had an operation for extrauterine pregnancy. Two years before entry she had had a severe attack of nausea and vomiting with abdominal pain which disappeared in several days without treatment. She had avoided sweets because of bilious attacks, but she had not noticed any idiosyncrasies for fatty foods. The family history was noncontributory.

The temperature was 99.6°F., the pulse 88, and the respirations 22. The pressure was 164 systolic, 90 diastolic.

Physical examination revealed a well-nourished, co-operative woman in no apparent discomfort. The skin was sallow, and marked dehydration was apparent. The pupils were equal and reacted normally. Examination of the heart showed a regular rhythm and no murmurs. The lungs were normal. Examination of the abdomen showed no distention, no localized tenderness and no palpable masses. There was no tenderness in the costovertebral angles. The knee jerks were equal and active. A pelvic examination was not done.

The urine was of cloudy straw color and acid, with a specific gravity of 1.019, and showed a slightest possible trace of albumin and no sugar; the sediment contained 10 to 20 erythrocytes and 1 to 5 leukocytes per high-power field and frequent finely granular and occasional hyaline casts. The blood showed a white-cell count of 13,800 with 73 per cent polymorphonuclears, and a red-cell count of 4,800,000 with a hemoglobin of 87 per cent (Sahli). The icteric index was recorded as 25, but because of slight hemolysis of the specimen an accurate match was impossible.

Shortly after admission the patient felt some pain in the abdomen which was relieved by 1/6 gr. of morphine. The afternoon of entry she vomited about 200 cc. of dark-green fluid and soon after that 125 cc. more. Throughout the day after admission, extreme nausea persisted and vomiting followed any attempt to take fluid by mouth. She complained of some pain in the abdomen. An enema was given with fairly good fecal results. Vomiting continued, and on the second night after admission the vomitus consisted of dark-brown material with, at times, an extremely foul odor. X-ray examination of the abdomen showed marked dilatation of the loops of the small bowel. A faintly calcified area with a radiolucent center was present in the left side of the pelvis. A large ring-shaped area of calcification overlay the lower pole of the left kidney. The kidney outlines were of normal size and shape. The lumbar spine showed moderate hypertrophic changes.

An operation was performed on the third hospital day. The postoperative course was uneventful, and the patient was discharged on the eighteenth postoperative day.

Differential Diagnosis

Dr. Herbert L. Johnson: On physical examination at the time of admission this patient showed no distention, although the history suggests some type of intestinal obstruction. The absence of this sign is a significant fact and points

directly to a block high in the intestine. Low intestinal obstruction could not exist the number of days that this patient had been ill without some distention. The absence of localized tenderness is probably due to the fact the bowel was fairly well emptied by vomiting.

There is a history of an attack of nausea, vomiting and abdominal discomfort two years previously which cleared in several days without treatment. This is consistent with high intestinal obstruction, which probably was relieved by the bowel's being emptied by reverse peristalsis, with subsequent disappearance of obstruction.

Early in the onset of her second attack this patient had two bowel movements. She had no more until she had an enema in the hospital. In cases of obstruction I have noted the fact that it is difficult to convince patients with an acute block in the small bowel that they have obstruction. When one questions carefully it is found that there has been no diarrhea, but one or two fecal movements and a constant desire to defecate. Actually, the instant obstruction sets in there is this desire, and the patient often misleads himself and the family physician into thinking that the bowel is patent and that no obstruction is present. The fact that after several days she had a good result following an enema agrees with the picture we are trying to draw of high intestinal obstruction. The vomiting was apparently of fecal character and is in agreement with the above diagnosis.

Dilatation of the loops of small bowel on x-ray examination is corroboration of the assumption that this is small-bowel obstruction. The confusing part of the picture however is the following statement by the radiologist: "A faintly calcified area with a radiolucent center was present in the left side of the pelvis. A large ring-shaped area of calcification overlay the lower pole of the left kidney." I assume that this means a ring of calcification with a dark center.

I think this woman probably had a high small-bowel obstruction, but I cannot be sure as to what caused it. We must not overlook the fact that she had had a previous abdominal operation. It is possible that the calcified masses are related to blood clot or to placental tissue remaining after this previous illness. These masses may be calcified lymph nodes. That they are calcified masses within the bowel, however, is another possibility. It is difficult to be certain as to just what they are.

Any time that there is a story of a previous abdominal operation and of recent symptoms referable to the abdomen a relation existing between the two is of first consideration. Adhesions between the omentum and an old infected area or possibly a mass of clotted blood could afford a site for either herniation or kinking of the small intestine. Adhesions could also be secondary to an infection present at or following her previous laparotomy.

It is my belief that this patient had high intestinal obstruction due, most likely, to intraperitoneal adhesions.

DR. HENRY C. MARBLE: Did she have an intravenous pyelogram?

DR. MAGNUS I. SMEDAL: No; these were the only x-ray plates.

DR. MARBLE: Is that calcified area in the kidney pelvis?

DR. SMEDAL: It is exactly over the pole of the kidney.

DR. MARBLE: Why could not this be due to stones in the kidney? They could produce this entire picture.

DR. JOHNSON: The kidney outlines appear normal.

DR. MARBLE: She might have an acute hemorrhagic nephritis.

DR. J. BEACH HAZARD: The urinary findings do not suggest such a diagnosis. A blood nonprotein nitrogen was not done, but could of course be high in the presence of intestinal obstruction.

We might ask Dr. Smedal his interpretation of the calcified masses.

DR. SMEDAL: I said that they were gallstones causing obstruction of the small bowel.

CLINICAL DIAGNOSIS

Intestinal obstruction due to gallstone.

DR. JOHNSON'S DIAGNOSIS

High intestinal obstruction, probably secondary to intraperitoneal adhesions.

ANATOMICAL DIAGNOSIS

Gallstone (removed from small intestine).

PATHOLOGICAL DISCUSSION

DR. HAZARD: The findings in this case can best be given by Dr. Balch as my only specimen consisted of a gallstone measuring 3.9 by 3.2 by 2.9 cm. and weighing 20.3 gr.

DR. FRANKLIN G. BALCH, JR.: This case was rather a puzzle to us when the patient first came in because she seemed in better condition than patients usually are with intestinal obstruction. This diagnosis, however, was our first consideration, but we also considered gall-bladder disease; that is why we watched her for a few days. Then with her clinical condition growing worse and with the x-ray findings we were convinced that the diagnosis of intestinal obstruction was cor-

rect. On opening the abdomen we found multiple moderately distended coils of small bowel, with one loop reaching down to the pelvis. In the left side of the abdomen we felt a mass; we pulled the loop of small bowel over into the operative field and removed a gallstone which is shown in the upper of these two shadows. The body forming the lower shadow was never palpated.

I might say that these cases are comparatively uncommon. I looked up the cases at the Massachusetts General Hospital from 1898 to 1932, and only 10 occurred in some 500 cases of obstruction. I should like to emphasize what Dr. Johnson brought out, namely, that in the face of high obstruction a patient can have movements by rectum; because it is said that the bowels have moved does not exclude high intestinal obstruction, as was certainly the situation in this case.

DR. HAZARD: At the time this patient was admitted we were gallstone conscious; two months previously a patient with symptoms of high intestinal obstruction had come to autopsy, which revealed a gallstone that obstructed the terminal ileum. The way large gallstones get into the intestine is usually through a fistula between the duodenum and the gall bladder. Gallstones have been reported up to about 10 cm. in diameter.

A PHYSICIAN: What was the local condition in the bowel at the point of obstruction? Did it look as though the stone had been there for any length of time?

DR. BALCH: No; the bowel was in good condition. I think the gallstone should be removed in most cases by backing it up and taking it out where the bowel has a wider lumen. In this case, however, as the bowel was in good condition, we took it out where we found it, which I think was about at the junction of the jejunum and ileum.

DR. HAZARD: Plates taken twelve days after operation showed an absence of both calcified masses, so that she must have passed the second stone.

DR. MARBLE: Does Dr. Balch think that the history of pain as given is accurate? "A very moderate amount of pain" is the only entry in the whole record. Is this not a small amount of pain for an acute intestinal obstruction which is complete?

DR. BALCH: I do not believe that she had complete obstruction until shortly before the operation was performed. I think the stone was coming down the intestine.

DR. MARBLE: Would you not expect her to have more than "a very moderate amount of pain"?

DR. BALCH: Yes, provided she had a complete obstruction.

DR. MARBLE: I thought obstruction and pain went hand in hand. Apparently this woman had a painless obstruction.

DR. BALCH: She had pain, but it was not severe.

DR. MARBLE: I saw a patient the other day who had a kidney stone with obstruction. She was vomiting and showed a clinical picture similar to that in this case. Furthermore, last summer I saw a patient with obstipation and much more pain than this patient had. Two days afterward he was found to have an acute hemorrhagic nephritis. The intestinal symptoms were due to ileus associated with renal disease. Considering the small amount of pain which this patient had, I still believe that kidney disease should be included in the differential diagnosis of the case.

I also want to add that there is no note in this case that the patient had hyperactive audible peristalsis associated with the pain.

CASE 6395

PRESENTATION OF CASE

A forty-seven-year-old, retired, American business man was admitted, with the complaint of pain in the right shoulder and chest.

About five months before admission the patient developed an aching pain in his shoulder after shooting. This seemed to be near the joint but was not aggravated by moving his arm. He also noticed at this time that he tired easily. About a month later, after he had been doing some heavy work, the soreness in his shoulder suddenly increased. At this time he noted a slightly elevated temperature in the morning, which increased a degree or two in the afternoon. This continued for a period of about four weeks. X-ray films of the chest were taken and were said to show a lesion in the right apex. He was sent to bed and had remained there constantly until admission. The pain in the shoulder continued to grow worse and markedly disturbed his sleep. Aspirin was given with no relief, but it resulted in profuse perspiration. He occasionally had slight cough in the morning, which was unproductive. Coughing or sneezing resulted in some pain in the chest, which seemed to be partly in the muscles but for the most part inside the chest. He was unable to lie on his right side. The pain was of an aching character but was not very sharp and was most marked in the late afternoon and evening. It was aggravated when he moved. Profuse night sweats occurred and were sufficient to require change of pajamas. He had had a loss of appetite but had forced himself to eat. He had also noted a marked loss of "pep" since being in bed and had not felt like getting up.

There had been a weight loss of 30 pounds during the five months preceding entry.

About twenty-five years before admission he had had dysentery but had recovered completely. He had had the usual childhood diseases. Many years before admission he had had an attack of "rheumatism" in his back and arms.

His father had died, probably of tuberculosis. His mother, wife and son were living and well. One grandfather and two aunts had had diabetes.

On admission his temperature was 99.6°F., the pulse 100, the respirations 21, and the blood pressure 140 systolic, 70 diastolic.

Physical examination revealed a suggestion of clubbing of the fingers. There was no atrophy of the intrinsic muscles of the hand. The pupils were slightly irregular in outline, of about equal size and reacted to light and accommodation; the eyegrounds were normal. Some teeth were missing, but those remaining were in satisfactory condition. The tongue was coated. There was no enlargement of the lymph nodes. The thyroid isthmus was palpable, but no nodules were noted. There was some limitation of motion of the right chest as compared with the left, especially in the apical region; examination of the chest was otherwise negative. The heart was not remarkable. The knee jerks were present, and the extremities were not remarkable. There was no limitation of motion in the upper shoulder girdle.

A urine examination showed a very rare leukocyte in the sediment. The blood had a white-cell count of 13,150 with 78 per cent polymorphonuclears, and a red-cell count was 3,700,000 with a hemoglobin of 75 per cent (Sahli). A stool examination was not remarkable. A blood Hinton test was negative.

X-ray examination of the cervical and dorsal segments of spine the day after admission showed normal bone texture throughout. Stereoscopic films of the chest revealed a cloudy density occupying the entire right apex, with increased lung markings in the ascending bronchial branches. The remainder of the right lung field and the entire left lung field were normal except for several areas of calcification on each side. The diaphragmatic outlines were smooth, and both angles were clear.

On admission Sodium Amytal and phenacetin were administered for the pain in the right shoulder, with some relief, but morphine was required to induce sleep. His temperature rose to 102°F. the night of admission and continued between 99 and 103°F., with a marked upward swing in the evening, throughout his forty-three-day stay in the hospital. The pain persisted but was controlled by Sodium Amytal or chloral hydrate. His body weight on admission was 146 pounds and on the twenty-fourth day of his hospital stay was 138 pounds. Three blood cultures were negative. Two tuberculin (dilution 1:10,000) tests were negative. One sputum obtained on the second day after entry was negative for acid-fast bacilli. A second chest film made twelve days after admission presented no change in the appearance of the right apex, but in addition a small patch of cloudy density was seen in the left apex; on reviewing the previous films the same area was found to be present. A flat film of the abdomen showed downward displacement of the gas-filled hepatic flexure and proximal transverse colon, apparently by an enlarged liver. Re-examination of the cervical and upper dorsal region of the spine was again negative. A gastrointestinal series performed sixteen days after entry was negative, as were films of the cranial sinuses and the skull. An oral Graham test performed twenty-two days after admission showed no filling of the gall bladder with the dye either before or after a fat meal and no evidence of opaque calculi. X-ray films of the chest taken for bone detail showed numerous cavities in the area of increased density at the right top.

Because of a possible relation between the chronic cholecystitis suggested by Graham test and pain in the right shoulder, exploration was advised, and a cholecystectomy and exploratory laparotomy were performed about a month following entry. A culture of the gall bladder was negative. For a few days following operation, the pain in the shoulder disappeared but soon reappeared. The patient's temperature dropped almost to normal for a day or two but then rose. Agglutination tests for tularemia and undulant fever were negative. The patient's white-cell count varied during his stay from 13,000 to 16,500 and on discharge was 14,350, with the polymorphonuclears ranging from 63 to 75 per cent. The red-cell count varied from 3,400,000 to 4,000,000.

On the forty-third day after entry the patient was discharged home to the care of his family physician, with instructions to say in bed for a while and to become ambulatory gradually.

Following discharge he continued to run a fever, gradually lost weight and strength, and died approximately six months after leaving the hospital.

Differential Diagnosis

Dr. Theodore L. Badger: The essentials in regard to this forty-seven-year-old man are that he was ill for nearly a year with fever and had pain in the right shoulder, loss of weight, fatigue, loss of appetite, unproductive cough and an x-ray showing a lesion in the lung. Looking at the first x-ray film taken in this hospital we find evidence of a healed primary tuberculosis, and in the right apex there is a definite flocculent infiltra-

tion which has the appearance of an active tuberculous lesion. There seems to be no deformity of the chest, and no asymmetry. The trachea is in the midline. There is a little haziness of the left apex, but this is not of great importance. There was an early family history of tuberculosis.

On physical examination the only findings are slightly clubbed fingers. No mention is made of rales or other positive physical findings in the lungs.

His entire stay in the hospital was characterized by fever which ranged from 99 to 103°F., and I presume it continued until he died. The tuberculin test was negative in a dilution of 1:10,000. Any tuberculin test, however, should not be considered negative unless finally done in a 1:100 dilution of old tuberculin (O.T.) of known potency. It is possible that the long-continued fever had reduced his resistance and, hence, that he did not respond. Only one sputum analysis was reported, and it is a little difficult to know from that whether it was really negative. Gastric lavage under these circumstances would have been of importance; it is interesting how frequently acid-fast organisms are found in such material from patients whose sputums have previously been reported negative. Therefore we are at a loss to know whether there were tubercle bacilli present. The x-ray films show a progressive lesion at the right apex, with increased density of the markings at the hilus and at the apex of the lung. The cavitation shown in the Bucky plate has a honeycomb appearance.

During his stay in the hospital there was a weight loss of 10 pounds. A gall-bladder operation was performed; the only report given is that of a negative culture, and no note is made as to the character of the gall bladder or as to other findings that may have been present.

The final diagnosis of this case is open to some speculation. In regard to the possibility of its being tuberculosis, we have a history that the trouble started following trauma, namely shooting, and that not so long afterward he developed pain, cough and fever. Trauma can cause a quiescent tuberculous lesion to become active, and there are many such records. Blows on the chest and repeated shooting with a rifle or shotgun have been reported as a cause of reactivation. In this case the onset was somewhat insidious. The night sweats, persistent fever and unproductive cough are all consistent with tuberculosis. Physical examination was not particularly helpful, the only findings of interest being those of limited expansion of the chest. This x-ray film is quite in keeping with tuberculosis; however, I do not believe that any x-ray picture, no matter how much it looks like it, is typical of this disease. Tuberculosis can be simulated by a suppurative process and even by a fungous infection of the lung. Against tuberculosis we have the fact that the patient had a progressive apical lesion by x-ray, with little or no expectoration and no demonstrable tubercle bacilli.

A second possibility in diagnosis is that of carcinoma of the lung. There are several factors which indicate primary neoplasm of the lung rather than tuberculosis. Pain in tuberculosis is common, but in this case the constancy and the deep-seated, boring character of this symptom are indicative of a tumor. A loss in weight occurs with tuberculosis as well as with cancer, but such a marked loss as he showed favors the latter.

If we make a diagnosis of cancer, should we call it primary bronchiogenic or metastatic, and if the latter, where is the original focus? No mention is made as to what was found in the gall bladder. The relation between the pain in the shoulder and the gall bladder was pointed out, but I am inclined to believe that it is of little significance.

My final diagnosis in this case is cancer of a bronchus of the right upper lobe, with suppuration distal to the lesion. Chronic progressive pulmonary tuberculosis would seem most unlikely.

Clinical Diagnosis

Tumor of right apex of lung.

Dr. Badger's Diagnosis

Bronchiogenic carcinoma of right upper lobe of lung.

Pathological Diagnoses

Poorly differentiated primary carcinoma of right apex of lung, with direct extension to adjacent ribs, intercostal muscles and vertebrae.
Emphysema.
Ascites.
Myocardial fibrosis.
Surgical absence of gall bladder.

Pathological Discussion

Dr. J. Beach Hazard: As Dr. Badger has stated, the lesion in the apex of the lung was a primary carcinoma. There was no infection in the lung tissue, but there was very extensive necrosis of the tumor in many portions and I think that might have caused the fever. There were several large emphysematous blebs in the vicinity of the tumor and they probably accounted for the area suggesting cavitation in the x-ray films. Distant

metastasis from the tumor had not occurred; there was, however, direct extension to the intercostal muscles and to the adjoining bone.

The gall bladder showed slight chronic inflammation in its wall but was otherwise negative.

This tumor belongs to the group of superior sulcus tumors to which attention has been called by Pancoast.* It is not the typical syndrome described by him, however, as the cervical sympathetic chain was not involved, so as to cause a Horner's syndrome.

*Pancoast, H. K.: Superior pulmonary sulcus tumor; tumor characterized by pain, Horner's syndrome, destruction of bone and atrophy of hand muscles. J. A. M. A. 99:1391-1396, 1932.

DR. EDWARD L. YOUNG: Is the fever characteristic of this type of malignancy?

DR. BADGER: Not unless there is some necrosis of tumor.

DR. YOUNG: You might wonder why I operated on this patient. I did it purely on the basis of the possibility of metastatic cancer; I thought the gall bladder might be the primary focus.

REPORT ON MEDICAL PROGRESS

HEART DISEASE*

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THE challenging problems of heart disease provoke innumerable investigations. In the following brief report a few subjects have arbitrarily been chosen for discussion because of their clinical interest and practical bearing.

RHEUMATIC FEVER

Etiology

The intensive search for the causative agent of rheumatic fever based on the infectious theory of its origin has continued with interesting but as yet inconclusive results. Inoculation of material derived from human arthritic exudates, rheumatic pleural exudates or excised erythema nodosum nodules into the chorioallantoic membranes of chicken eggs has produced characteristic lesions.[1] Suspensions of these lesions when injected into mice caused pneumonia. Micro-organisms resembling the pleuropneumonia-like organisms isolated by Sabin[2] from normal mice were recovered from the lungs of such infected animals. Similar micro-organisms were, moreover, cultured directly from human rheumatic exudates and produced the same type of pneumonia in mice. Suitable control studies failed to disclose such micro-organisms in non-rheumatic exudates. The pleuropneumonia-like micro-organisms studied by Sabin, while morphologically similar to those isolated by Swift and Brown,[1] failed to induce pneumonia in mice. These findings are of considerable interest, but further work will be required to demonstrate conclusively their etiologic significance in the causation of rheumatic fever.

The etiologic influence of various contributory factors is generally recognized. Rheumatic fever occurs most commonly in the temperate zones. It is relatively rare in the tropics and in the arctic regions and, correspondingly, its onset in the temperate zone is relatively uncommon in the middle of the summer and during the cold winter months. The increased incidence of rheumatic fever in the lower economic groups emphasizes the etiologic importance of general hygiene, adequate nutrition and the effects of overcrowding. Rheumatic fever becomes prevalent during epidemics of upper respiratory infection and is prone to occur when scarlet fever is rampant. Following fully 50 per cent of the sore throats in rheumatic fever subjects,[3, 4] a recurrence of rheumatic fever occurs.

The factors of susceptibility and communicability of rheumatic fever have been stressed by several recent investigations. That heredity is of significance, in addition to the factors of contagion and environment, is demonstrated by trustworthy recent evidence which is in accord with previous investigations.[3,5–7] While the familial incidence has long been recognized it is not generally realized that it is, in fact, as high as that of tuberculosis.[4] Rheumatic manifestations in the parents, aunts, uncles and grandparents of rheumatic patients are definitely increased over those in control groups.[3, 6] Between the patients and their siblings and parents there is usually contiguity as well as consanguinity, but the uncles, aunts and grandparents of the patients, in the majority of cases, do not

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belong to the same household or to the same immediate environment. The finding of a familial tendency for at least three generations is strongly suggestive of a constitutional susceptibility to this disease. These findings do not, of course, contradict the etiologic significance of exposure and hygiene.

Clinical Characteristics and Diagnosis

Intelligent clinical care of the patient with rheumatic fever depends in large measure on the recognition of certain features emphasized by recent publications.

The chronicity of rheumatic fever. Characteristic symptoms and signs such as joint pain of varied degree, low-grade fever, subcutaneous rheumatic nodules, erythema marginata, frequent nontraumatic nosebleeds, abdominal or precordial pain, anemia,* loss of weight or even failure to gain weight may persist for months or years. Sydenham's chorea has long been considered to be associated with rheumatic fever, and the relation is indeed close. Recent studies[7, 9] have shown that, of those children exhibiting only chorea, approximately 50 per cent will within the following eight years show other manifestations of rheumatic fever. The incidence of heart disease in children with other rheumatic manifestations is approximately the same regardless of the presence or absence of chorea. The incidence of heart disease in those children who do not show other rheumatic manifestations, but who may have recurrence of chorea, is strikingly low, amounting to only 3 per cent. It therefore appears that chorea should continue to be regarded as frequently, although not invariably, signifying rheumatic infection.

Subclinical rheumatic fever. Evaluation of the presence or absence of active rheumatic fever is perhaps the most important feature to be determined in the clinical care of the patient with rheumatic heart disease or previous rheumatic fever. Medical attention has been directed too long to an appraisal of the degree of rheumatic heart disease or an interpretation of various cardiac murmurs. Clinical symptoms and laboratory tests indicative of the presence of active rheumatic fever have been minimized. It is important to recognize even subclinical rheumatic fever, since such patients are prone to exacerbations of the disease and must be protected from various events and placed at complete rest. It is the active disease, rheumatic fever, which is responsible for the fatal outcome in children and young adults.

With the cessation of the clinical manifestations of rheumatic fever, there is usually laboratory evidence of the continuation of the active process for varying lengths of time, from two or three months to several years. This phase is denoted by an increase in the sedimentation rate of the red blood cells, repeatedly elevated leukocyte counts (above 10,000), and, less often, prolongation of auriculoventricular conduction time by electrocardiogram. The apparently silent development or increase in the development of rheumatic valvular involvement is readily understandable on the basis of these considerations.

Recurrences and recrudescences of rheumatic fever. It is unusual in childhood for the patient to have only a single attack. There is no evidence available which indicates definitely whether or not recurrences are an expression of reinfection. The severity of the individual recurrences is to a large extent the determining prognostic feature. Especially important with regard to recurrences are the first five or six years following the onset of rheumatic fever, since the disease most often recurs during this period. The majority of rheumatic fever subjects who do not develop considerable cardiac damage, especially cardiac hypertrophy, during this time have a good prognosis.

Certain events have been noted which seem to precipitate the clinical manifestations of rheumatic fever. Exacerbations are often associated with upper respiratory infections. Usually, rheumatic fever develops within one to three weeks after such an event, there being at times a so-called silent or latent period. The frequency of recurrences of rheumatic fever following such a procedure as tonsillectomy is too often disregarded. Other operative procedures, accidents such as broken bones, severe sunburn, extraction of teeth and a variety of minor non-streptococcal illnesses have been observed to precipitate rheumatic fever.[10] Injection of stock typhoid vaccine (0.1 cc. of vaccine containing 250,000,000 organisms), resulting in a moderate temperature reaction and a chill, likewise may reactivate quiescent rheumatic infection.[10]

As with other conditions which have attracted widespread interest and study, the positive diagnosis of rheumatic fever is not infrequently made falsely; the patient is crippled not by the disease but by the diagnosis. Recent studies[11–13] on the significance of so-called growing pains in children exonerate these vague muscular pains and aches in the lower extremities from the ominous significance attributed to them by some clinicians.

In a number of recent publications, patients with so-called growing pains have been considered as rheumatic subjects. Shapiro[11, 13] states, however, that growing pains are not due to rheumatic infection, and that the great majority of children who complain only of leg pains are not suffering

from rheumatic fever. In a follow-up study of 200 children who complained only of leg pains Shapiro found that none developed rheumatic heart disease. The salient diagnostic characteristics to be borne in mind in the differential diagnosis of growing pains and of joint pains of subacute rheumatic fever are shown in Table 1.

TABLE 1. *Differences Between Nonrheumatic Growing Pains and Joint Pains of Subacute Rheumatic Fever.*[11, 13]

	NONRHEUMATIC GROWING PAINS	JOINT PAINS DUE TO SUBACUTE RHEUMATIC FEVER
Age at onset	Early childhood; often continues through adolescence.	Most commonly between 6 and 7 years of age; often occurs in attacks following upper respiratory infections or other infectious diseases.
Time of pain	At end of day, especially during night, often awakening the child several times; pain is gone in the morning and usually does not occur during the day.	On first getting out of bed in the morning and during entire day, especially on motion; often causing limp; patient feels better on getting warm in bed.
Location of pain	Most commonly in muscles of legs and thighs, rarely in muscles of upper extremities; occasionally involves knee joints.	In joints themselves, of upper and lower extremities.
Other signs of rheumatic activity	Usually none	Repeated bouts of joint pains; nosebleeds; characteristic skin rash; pallor, fever and so forth.
Objective signs in joints	None	Joints often have slight increased local heat and mild swelling, usually overlooked by patient and parent.
Family history of rheumatic fever	Uncommon	Common
Laboratory findings	Normal sedimentation rate; normal leukocyte count; normal hemoglobin.	Increased sedimentation rate; mild increase in leukocyte count; moderately decreased hemoglobin.

Prognosis. The paucity of reliable statistics regarding so widespread a disease is remarkable. Jones[4] has summarized his observations on 1000 subjects with rheumatic fever followed for an average period of ten years from the onset.[14] The average age of onset was eight, the average age at the time of the last observation was eighteen, hence the data represent the first decade of rheumatic fever. Of this group 242 were dead, 310 had no demonstrable rheumatic heart disease, 427 patients had definite rheumatic heart disease and in 21 the data were insufficient. It is somewhat encouraging to know that in this large group of patients nearly 60 per cent were able to carry on a normal physical life ten years after the onset of their disease. In an encouraging percentage, clinical evidence of rheumatic heart disease regresses or even disappears.

Treatment

Sulfanilamide. The effectiveness of sulfanilamide and its derivatives in a wide variety of infectious states led to the hope that the active manifestations of rheumatic fever might likewise prove responsive to these therapeutic agents. The close relation of rheumatic fever to hemolytic streptococcus respiratory infections lent encouragement. Convincing studies have demonstrated, however, that sulfanilamide exerts no beneficial effect on chorea or on active rheumatic infection in any of its stages.[15, 16] On the contrary, an increased incidence of toxic reactions to sulfanilamide has been observed in patients with manifestations of active rheumatic infection. There is no evidence that sulfanilamide produces any symptomatic relief or abridgment of the illness.

In patients with rheumatic heart disease suffering from acute hemolytic streptococcus respiratory infection the question not infrequently arises as to the advisability of sulfanilamide therapy. Conservative clinical judgment must be exercised in such cases, particularly since the incidence of recurrence of active rheumatic fever following sulfanilamide therapy is not decreased and may be increased. Encouraging results[17, 18] have been reported regarding the prophylactic value of sulfanilamide in quiescent cases in preventing streptococcal throat infections and associated exacerbations of rheumatic infection. The general use of sulfanilamide for this purpose cannot be advised until considerably more evidence has accumulated. In general, it must be concluded that sulfanilamide is valueless and even dangerous in the treatment of active rheumatic fever.

Tonsillectomy and foci of infection. Since the etiology of rheumatic fever is closely associated with streptococcal infection, the removal of foci of infection, especially tonsils and adenoids, has been a major feature of the treatment of the disease. There is at present no distinct agreement concerning the value of such a procedure, particularly since so many patients have had a tonsillectomy performed prior to the onset of rheumatic fever.[19] It has previously been suggested that tonsillectomy be performed during the height of rheumatic fever, but this practice has been discarded. It would seem wise in general to advise tonsillectomy in a patient with a history of very frequent sore throats, but only in the absence of clinical and laboratory evidence of active rheumatic fever. In this way many recurrences of rheumatic fever will be avoided. Extraction of teeth should also, if possible, be carried out in the absence of active rheumatic fever, for fatal recurrent rheumatic fever may follow such a procedure.[19]

Other measures. In the absence of any proved specific measures for treatment of rheumatic

fever, reliance must be placed on the use of salicylates whenever necessary for the comfort of the patient, absolute bed rest, the judicious use of sedatives, a diet containing all essential elements and the establishment of a satisfactory psychologic adjustment to the illness.

Calcareous Aortic Stenosis

This cardiac lesion, frequently overlooked and predisposing to sudden death, has continued to stimulate considerable interest.

Aortic stenosis in young individuals with obvious rheumatic heart disease is comparatively common and offers little difficulty in diagnosis. Calcareous aortic stenosis, on the other hand, is prone to occur or be discovered relatively late in life, predominantly in men who have no antecedent rheumatic history. The symptoms of cardiac asthma, congestive heart failure or angina pectoris as a rule cause the patient to seek medical advice. He usually shows considerable cardiac enlargement, together with a slow pulse rate and normal or decreased pulse pressure. The absence of any obvious etiologic cause for the cardiac symptoms other than general arteriosclerosis, together with the slow pulse and cardiac enlargement, should lead one to suspect calcareous aortic stenosis as the cause. The diagnosis is confirmed by the presence of a thrill and systolic murmur in the aortic area, transmitted upward into the carotid artery and often accompanied by a diastolic murmur.

The lesion and its symptoms are likely to appear late in life and progress slowly. It is important to realize, however, that the prognosis is poor. The symptoms respond poorly to therapy and sudden death is common.[20-22] This is of particular importance when considering the advisability of surgical procedures.

The lack of adequate information concerning the etiology has been the cause of considerable interest and speculation. The lesion was first described accurately by Monckeberg in 1904, and has been ascribed as resulting from atherosclerosis, from some unidentified form of chronic inflammation, from some toxin and from rheumatic fever, and the idea has been advanced that the lesion represents the healed vegetations of subacute bacterial endocarditis.

Christian[23] in 1931 subscribed to the rheumatic etiology of calcareous stenosis of the aortic valve, a view supported by others.[24, 25] Recent studies[26] indicate that in the cases with mitral valvular deformity, rheumatic etiology is predominantly responsible, while in the cases of pure aortic valvular stenosis without mitral involvement arteriosclerotic degeneration is often responsible. The fact that this type of aortic valvular disease is a clinical entity does not necessarily indicate that it is an etiologic entity. Arteriosclerotic degeneration and rheumatic fever are each probably responsible in different cases.

Medicinal Treatment of Angina Pectoris and Myocardial Infarction

The object of medicinal treatment is to control the symptoms and functional disorders of the heart and circulation. There are no chemical agents that are known to influence materially the course of the structural abnormality in the myocardium or coronary arteries. The treatment of angina pectoris must be varied and adapted to fit the individual needs of each patient. In some cases an abnormality of the blood or basal metabolism or an unusual sensitivity to coffee or tobacco may be an important factor. In others, careful study of the patient's daily routine and contacts with people may reveal a constant relation between the occurrence of attacks and emotional factors or habits of eating which may be avoided or corrected. Surgery may be advisable in a few. In most patients, however, the skillful use of drugs, singly or in combination, is of paramount importance in the treatment of angina pectoris.

The problem of drug therapy in angina has been the subject of many studies. Evans and Hoyle[20] and more recently Gold and his associates[27, 28] have thrown doubt on the efficacy of medicinal therapy in angina, for they found that clinical improvement followed placebo medication as often as it did the use of drugs of reputed value. Riseman and his co-workers,[29, 30] instead of relying solely on clinical impressions, have also measured the amount of work under standard conditions which patients could perform before heart pain developed. According to these carefully controlled objective measurements, certain drugs were found to be of distinct therapeutic value. A knowledge of certain characteristics of these drugs is of considerable practical importance in their clinical use. More recently Levy and his associates[31] have shown that certain of these drugs prevent or delay the production of the electrocardiographic changes induced by anoxemia in patients with angina.

The Nitrites

Nitrites are generally acknowledged to be of great value in the pain of angina pectoris, but certain useful aspects have been stressed in recent communications. While many patients experience marked benefit from nitroglycerin, others derive no beneficial effects and in a few the

attacks are aggravated.[32] Certain patients are unusually sensitive to the disagreeable effects: flush, headache, throbbing and sensation of tension in the head, palpitation and even giddiness and fainting. Rarely patients may show marked pallor, perspiration and a fall in blood pressure but no electrocardiographic changes following the administration of 1/100 gr. of nitroglycerin. For all practical purposes 1/200-gr. hypodermic tablets are usually as effective as 1/100-gr. ones and are rarely associated with any untoward effects; 1/500 gr. is less effective.[32] In all cases, much is to be gained by administering a test dose in the office or at the bedside and personally observing the effects.

The use of tablets which dissolve readily under the tongue, such as those prepared for subcutaneous use, are to be preferred. The ordinary tablet triturates frequently have little or no effect on the duration of pain. Hypodermic tablets dissolve completely in fifteen or twenty seconds, and only rarely require as long as twenty seconds. The tablet triturate and the granules require one or two minutes for complete solution.

While the commonest use of nitroglycerin is to decrease the duration of pain, the drug has a prophylactic value which has received insufficient attention.[30, 33] Murrell's original communication[34] advocated the administration of nitroglycerin several times a day in order to prevent attacks, and more recently its use immediately before exertion is undertaken has been suggested.[33] Riseman and Brown[30] observed that approximately one third of their patients could be rendered completely free of attacks by taking 1/500-gr. hypodermic tablets under the tongue at hourly intervals during the day. For preventing attacks it is important to realize that small doses (1/500 gr.) are quite as effective as large doses.

Patients often inquire whether the frequent use of nitrites will eventually lead to dependence on the drug, and whether such use reduces the efficacy of the medication. The patient may be assured that neither of these consequences will occur.

All the nitrites act qualitatively alike. The perle of amyl nitrite, commonly used by inhalation, is usually not so satisfactory as the tablet of glyceryl trinitrate. The cost, and the odor, which may be especially marked if released in a closed room, are definite drawbacks to its use. Furthermore, absorption from the lungs is more rapid than that from the sublingual tissues, and since the exact dose cannot be determined accurately, alarming symptoms may be precipitated in patients who inhale deeply. An interesting contribution to the subject of nitrite therapy was recently published by Krantz and his collaborators.[35] They prepared octyl nitrite, a liquid less volatile and less potent than amyl nitrite. Octyl nitrite inhalers are still in the experimental stage, and clinical evaluation is necessary before its usefulness in the treatment of angina pectoris can be determined. Levy[36] recommends erythrol tetranitrate in a dose of ½ gr. (0.03 gm.) at bedtime to control attacks of pain which are likely to occur during the night. Sodium nitrite, long in favor, is used less commonly, primarily because more potent preparations are available. This drug is not stable, and on standing forms the less effective nitrate.

There is some hazard in the use of nitrites in the acute phase of myocardial infarction. The nitrites by causing a fall of blood pressure reflexly stimulate the cardiac accelerators, and may precipitate dangerous ectopic tachycardias. By further lowering the blood pressure, which may already have fallen considerably, the blood flow in the patent coronary vessels and hence the collateral circulation may be impaired, since the efficiency of the coronary circulation depends in great measure on an adequate level of systemic pressure.

Xanthines

Since attention was first directed to the use of the purine bases in the treatment of angina pectoris,[37] numerous preparations have been advocated. Theobromine and theophylline are not soluble in water, but when mixed with ethylenediamine, or certain salts such as sodium acetate, they readily go into solution. Many preparations using various soluble salts and with dubious claims have been offered to the profession at exorbitant prices which impose a considerable financial burden on the patient. Of the theobromine preparations, theobromine sodium acetate in doses of 7½ gr. (0.5 gm.) given four times a day appears to be far superior to all other preparations of theobromine and is as effective as the best of the theophylline compounds.[29] From the practical standpoint, it is pertinent that the cost of a week's supply of theobromine sodium acetate on prescription is approximately 45 cents, compared to a cost of $1.50 for most other preparations on the market. Theophylline sodium acetate is as effective as theobromine sodium acetate. This preparation has the advantage of being effective in a smaller dose than the theobromine salt, and therefore a smaller size tablet is available. For years this has been a proprietary preparation, but it is now being made available by several drug houses.

There has been considerable comment in the literature concerning the possible cerebral effects

of the purines. This is probably suggested by their chemical relation to caffein. No evidence of cerebral stimulation or kidney irritation has been presented.

The incidence of gastric distress can be reduced by coating the tablets so as to prevent contact with the gastric mucosa. The use of enteric coatings has outstanding value, but it must be remembered that an effective enteric coating delays absorption for four or five hours. Under such conditions a final dose just before retiring is of great importance, for otherwise the patient is without medication until the morning dose becomes available sometime in the early afternoon. In some cases it is advisable to give an uncoated tablet in the morning in addition to the enteric-coated tablets.[38] It must also be remembered that the use of strong cathartics may hurry the enteric-coated pill through the intestinal tract undissolved and hence prevent absorption.

In general, the frequency and degree of improvement increase as the dose is increased. All theobromine and theophylline derivatives cause nausea and heartburn when given in sufficiently large amounts, and when this gastric distress becomes severe, any improvement induced by small doses disappears. The optimum dose for most patients is the maximum amount that can be given without causing severe gastric distress; in a few cases equally satisfactory improvement can be obtained with somewhat smaller doses. Whether a patient with angina will respond to the purines and what the optimum dosage will be cannot be foretold; each patient must be individually studied.

In the treatment of cardiac infarction, the intravenous administration of theophylline ethylenediamine (Aminophyllin, Metaphyllin, Euphyllin, Carena, Inophyline) may be effective in alleviating pain. A dosage of 4 gr. given slowly has been recommended,[39] but somewhat larger doses may be employed.

Tissue Extracts

Rumors as to the clinical effectiveness of tissue extracts have been frequent since their introduction by Schwarzmann in 1929.[40] No objective evidence exists that they are of value.

Quinidine

The use of quinidine sulfate in angina pectoris was recommended by Proger, Minnich and Magendantz.[41] The exact mechanism whereby its effect is achieved is unknown. Riseman and Brown[30] believe that this drug should be used more frequently in the treatment of angina. Doses of 5 gr. (0.3 gm.) four times daily give striking benefit in many cases. An occasional patient may prove to be hypersensitive or show an idiosyncrasy to this drug, but such individuals are rare; diarrhea of moderate severity is commoner; in such cases the dose should be decreased.

Quinidine is also useful in the treatment of auricular flutter and paroxysmal auricular or ventricular tachycardia which may be accompanied by angina pectoris, and prophylactically in cases of myocardial infarction which show numerous ventricular extrasystoles.

Sedatives

The use of sedatives such as the barbiturates in small, repeated doses is of considerable value in patients with angina pectoris. They probably lessen the sensitivity of the patient to emotional stimuli, and may also decrease the rate at which exercise is undertaken in daily life. Only moderate doses are advocated such as ¼ to ½ gr. of phenobarbital three times a day. It is inadvisable, however, routinely to combine the sedative with other drugs in a single tablet or capsule in fixed proportions, for the optimum dosage of each ingredient varies for different patients.

Morphine

While fully agreeing with the widespread use of morphine in cases of myocardial infarction, Gold[27] cautions that it sometimes complicates the course of myocardial infarction. It promotes constipation with abdominal distention, and urinary retention through spasm of the bladder sphincter. It also causes vomiting, which may be repeated over a period of several hours. This violent muscular effort is a source of danger in myocardial infarction. It is also a source of confusion in that one may be at a loss to determine whether the vomiting is due to the drug or to the myocardial infarction itself. Morphine causes strong vagal stimulation, and this renders the heart more susceptible to auricular and ventricular ectopic rhythms. Gold states, "One may well ask how often ventricular tachycardia after coronary thrombosis is due in part at least to the morphine with which the condition was treated."

The following plan is applicable in the majority of cases: ¼ gr. (0.016 gm.) of morphine sulfate by subcutaneous injection, repeated at intervals of one-half hour until the pain is abolished or reduced to a minimum. The interval between doses should not be shorter, and to give more than a total of 1 gr. (0.065 gm.) in twelve hours is rarely wise. Larger doses than 1 gr. are rarely more effective in quieting the pain.

Severe pain, its attending anxiety and the distress of paroxysmal dyspnea are the three major indications for the use of morphine in the course of myocardial infarction. The vague notion is

entertained that morphine exerts a direct beneficial effect in coronary thrombosis independent of its influence on symptoms. There is no sound justification for this view.

Codeine in ½- or 1-gr. doses may occasionally be used with advantage as a substitute for morphine in mild cases, or in order to obviate the danger of withdrawal of symptoms in prolonged cases. Although dilaudid and pantopon are widely used, it is doubtful whether they have any advantages over morphine in this condition. If the patient is intolerant to morphine, so that ordinary doses cause vomiting or excitement, a combination in a capsule of ½ or 1 gr. of codeine with 1/150 gr. of scopolamine hydrobromide or with 1 gr. of phenobarbital will occasionally provide a satisfactory substitute.[27]

In cases in which pain is resistant to other measures, placing the patient in a tent with oxygen of about 50 per cent concentration is sometimes useful. It is especially indicated in patients with cyanosis or respiratory distress. While codeine and the other opium derivatives are clearly of value in the treatment of cardiac pain, they are of course unsuited for prolonged use.

Digitalis

The use of digitalis in angina pectoris and myocardial infarction continues to be widely debated. It is generally agreed that three conditions indicate the administration of digitalis: congestive heart failure, paroxysmal dyspnea and certain abnormal rhythms such as auricular fibrillation with rapid ventricular rates, auricular flutter and occasionally paroxysmal auricular tachycardia. A patient with these disorders should receive digitalis regardless of what accompanying conditions are present. The effect of digitalis in congestive failure and certain paroxysmal arrhythmias is to enable the heart to accomplish increased output and increased external work.

Most patients with myocardial infarction do not fall into any of the above categories and do not require digitalis. The manifestations of shock in patients with myocardial infarction are due to peripheral vascular collapse; digitalis is not more efficacious in this situation than it is in the peripheral vascular failure of pneumonia, sepsis or traumatic shock.

Patients with coronary arteriosclerosis not infrequently show partial heart block with either a prolonged PR interval or a 3:2 or 2:1 auriculoventricular response. The question then arises whether, in the presence of positive indication for the use of digitalis, the drug should be withheld, lest it increase the heart block and possibly produce complete auriculoventricular dissociation, with its hazard of ventricular standstill. Contradictory statements by acknowledged authorities and the absence of any body of evidence suggested the desirability of a study of this question by Altschule and myself.[42] The results of this study demonstrated that partial heart block is unaffected by digitalis in moderate therapeutic doses and that this drug should not be withheld in the face of positive indications.

A satisfactory dose in the average case of auricular fibrillation or heart failure in myocardial infarction is about 0.4 gm. of digitalis leaf daily for two days, followed by about 0.1 to 0.3 gm. a day as long as necessary. The patient should be watched carefully for the appearance of increase in the number of ventricular premature beats, which should serve as a guide to reduction of the dose.[27]

In patients with angina pectoris, digitalis is the subject of a wide divergence of opinion. Gold and his associates[43] reported that not one of their 120 cases of angina pectoris of effort was influenced unfavorably by even toxic doses of digitalis, and concluded that no direct constrictor action was exerted on the coronary circulation in patients with coronary artery disease. They believe that while patients within three weeks after myocardial infarction may react unfavorably to complete digitalization, doses of approximately three fourths of those which would be given if the patients did not have a myocardial infarct involve no special hazard.

In patients with angina of effort in whom evidence of congestive failure is found, administration of digitalis should improve the general circulation, including that of the heart. In uncomplicated angina, Riseman and Brown[30] observed that digitalis was rarely of value and frequently caused a striking increase in anginal attacks. This is in accord with the observations of Fenn and Gilbert.[44]

Potassium Iodide

While potassium iodide is of undoubted value in the treatment of the cardiac pain associated with syphilitic heart disease or thyrotoxicosis, no evidence of its value in other conditions is available.

No adequate means exist at the present time of predicting which drug will benefit a given patient with angina pectoris, or indeed whether the patient will respond to any medication in any degree. It is to be remembered that drug therapy is only one factor in the medical management. The regulation of the patient's dietary regime and program of activities, the wise adjustment of emotional factors, the use of moderate doses of alcohol and the correction of anemia, thyrotoxicosis or other organic ailments are of importance.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 25421

PRESENTATION OF CASE

A sixty-seven-year-old retired business man was admitted complaining of severe substernal pain of thirty-seven hours' duration.

At 2:30 a.m. while in bed, thirty-seven hours before admission, the patient was suddenly awakened by a severe substernal and midepigastric, "raw and oppressive," non-radiating pain, which "practically took his breath away" and which was unassociated with cough, sputum, hemoptysis, palpitation or evident cyanosis. He had difficulty in getting his breath because of a sharp stabbing pain on deep inspiration. He arose, felt weak, but walked across the room and applied rubbing alcohol to the anterior chest. When he returned to bed he was forced to remain in the sitting position because of orthopnea. The persistent pain prevented his return to sleep. Throughout the day before entry he was nauseated and noted malaise and anorexia. He was able to climb one flight of stairs without unusual dyspnea, and failed to notice any increase in the still persisting substernal discomfort. The evening before admission he was awakened every ten to fifteen minutes by the pain which forced him to sit upright in bed. On arising at 10 a.m. on the day of admission the pain and nausea were much more severe. He had retching but did not vomit. He was seen by a physician at noon and referred immediately to the hospital.

Two months before entry the patient had developed a painless tumor in his nose which grew steadily and caused complete obstruction of the nasal passages, with an associated epiphora. A biopsy of the tumor taken in the Out Patient Department two days before admission showed it to be a "lymphoblastoma, reticulum-cell sarcoma type." On the same day x-ray studies had been made. The family, marital and past histories were noncontributory.

The physical examination revealed a lean, suntanned man sitting up in bed and complaining of pain in the lower midanterior chest on deep inspiration. There was epiphora of the right eye. The fundal vessels were slightly arteriosclerotic. The nose was completely obstructed by a painless, irregular, red growth, which bled easily and which seemed to arise from the septum. The few remaining teeth were dirty and carious. The chest was rather flat and somewhat splinted on both sides. The heart was apparently not enlarged. The apex was in the fifth interspace in the midclavicular line, 10 cm. to the left of the sternum. The apical sounds were of good quality, but there was a suggestion of tic-tac quality over the remainder of the precordium. The aortic second sound was louder than the pulmonic. On admission to the ward at 3 p.m. there was present a definite to-and-fro apical friction sound, but four hours later it could not be heard. The pain on deep inspiration had also almost completely disappeared. The remainder of the examination was essentially negative.

The temperature was 98°F., the pulse 70, and the respirations 19.

The blood examination was normal. The urine sediment showed 10 to 15 white blood cells per high-power field. An electrocardiogram taken on the first hospital day showed a normal rhythm of 110 with a PR interval of 0.14 second; ST_1 and ST_2 were slightly elevated; T_3 was inverted; the QRS complexes in Leads 1, 2 and 3 were low; there was slight left-axis deviation.

In the early morning of the first hospital day the patient was awakened by a persistent recurrence of the original chest pain, and a friction rub, pericardial in timing, was heard over the apex in the fifth left interspace. There was tachycardia. Fifteen hours later the friction sound was gone. During this interval the electrocardiogram mentioned above was taken. On the third hospital day the patient was comfortable and had no pain, and the heart was normal on physical examination. An electrocardiogram showed a normal ventricular rate of 80; the PR interval was 0.13 second, with late inversion of T_2 and T_3; ST_2 and ST_3 were slightly elevated; there was low voltage of the QRS complexes in Leads 1, 2 and 3, and a slight tendency to left-axis deviation. On the fifth hospital day the temperature rose to 100.2°F., but the pulse and respirations remained at 86 and 20 respectively. On the tenth hospital day the corrected sedimentation rate was 1.8 mm. per minute, and the white-cell count 10,300. The patient was in no discomfort. The skin was dry, and there was no cyanosis or signs of heart failure.

He seemed well enough so that on the seventeenth hospital day x-ray treatment of the nasal lesion was begun. He was given a 400-r daily dose, to a total of 1200 r per nasal field. At the same time an electrocardiogram showed a ventricular rate of 100, normal rhythm, low T_1 and inverted T_2, T_3 and T_4, with slight improvement in the voltage as compared with the previous rec-

ord. After completion of x-ray therapy on the twenty-second hospital day the nasal lesion appeared smaller, and there was a beginning air passage through it. There was a slight temperature rise to 101°F., with a pulse of 110 and respirations of 30, as the only apparent evidence of x-ray reaction. Later, however, he developed severe frontal and nasal head pain requiring morphine for relief. On the thirty-first hospital day at 4:15 p.m. he developed an acute, severe, right shoulder pain, associated with a drop in blood pressure to 82 systolic, 70 diastolic, and the presence of cold clammy hands. The heart rate was 110, with irregular rhythm, weak sounds and an intermittent gallop. He became cyanotic, and one hour later he developed Cheyne-Stokes respirations and his blood pressure was not obtainable. He quickly failed and died.

Differential Diagnosis

Dr. Edward F. Bland: We are presented here with the record of a patient in whom the diagnosis of malignant lymphoma had been established. Although we know that this is an ultimately fatal disease, I think we have reason to suspect that this patient died rather prematurely. We might have expected that he would have lived several months longer and probably several years with adequate treatment. My x-ray colleagues assure me that a 1200-r exposure to the local lesion in three days is fairly vigorous treatment for each nasal field. Dr. Edward Gall has pointed out that this type of lymphoma is not quite so radiosensitive as are some of the others. We have clear evidence, however, that the nasal lesion was responding favorably to x-ray therapy.

Our problem is to determine why this patient died prematurely with a series of rather alarming episodes, the first of which precipitated his admission to the hospital and the fourth of which was responsible for the fatal termination. The episodes which occurred in the hospital followed a general pattern. They varied somewhat in detail. The first characteristic which warrants some attention is that they were all abrupt in onset. It was interesting that the first occurred during the night following the patient's visit to the Out Patient Department, when he had had a biopsy taken and had had x-ray studies and probably some unusual manipulation of his neck. The type of pain, it seems to me, was somewhat more characteristic of pleural origin than it was of cardiac origin; it almost certainly was not associated with coronary insufficiency, but it might have been of pericardial origin. Pericarditis may be an uncomfortable condition although often it is unaccompanied by actual pain. I think it is rarely associated with very severe pain such as this patient apparently had.

His heart and circulation seemed to have been in relatively good condition and without abnormal physical signs throughout the course of the fatal illness, until the last episode, except that I am a little in doubt as to the exact nature of the friction sound which was described as being fairly localized in the vicinity of the cardiac apex and pericardial in timing. I am inclined to think that this was of pleural or perhaps pleuropericardial origin rather than due to uncomplicated pericarditis. Pericardial friction rubs are ordinarily best heard over the body of the heart, either to the right or left of the sternum. It would be a little unusual then to have the sound localized so far out. Furthermore, the absence of tachycardia or any other indication of serious involvement of the heart itself seems to me somewhat against a purely pericardial origin.

Then we come to the electrocardiogram. It is quite evident that the heart was under grave suspicion. They took three electrocardiograms. The findings are abnormal but somewhat inconclusive as to the exact nature of the trouble. This patient was in the age group in which one expects some sclerotic changes in the coronary vessels. These abnormal electrocardiographic changes could have been due to underlying coronary disease or possibly secondary to acute cor pulmonale. Furthermore, they might have been the result of pericardial involvement.

Throughout the record nothing is said about x-ray studies of the chest. Dr. J. H. Means* has recently called our attention again to the extraordinary capacity of lymphoma for simulating other clinical conditions. We should like very much to know by x-ray study if there was any suggestion of cardiac or pericardial abnormality or any indication of involvement by the lymphomatous process of the thoracic viscera. No therapy was directed toward the chest, so I think we must assume that chest films were not taken and that no suspicion of a thoracic lymphomatous lesion was entertained by those in charge of the patient. At least I cannot otherwise explain why no mention is made of a chest film. However, I think we must accept its absence, but with some reservation, as evidence against lymphomatous involvement of the thoracic viscera. But so far as I am concerned, it is not only conceivable, but we know, that lymphoma may rather silently infiltrate the pericardium and give rise to pericarditis and a large pericardial effusion. Lym-

*Means, J. H.: The symptomatology of lymphoma. J. A. M. A. 113:646-649, 1939.

phoma may also invade the myocardium itself.

Dr. Tracy B. Mallory: The chest was never x-rayed, so far as I can make out from the record.

Dr. Bland: Then we come to the final episode which, I think, is of considerable interest. It was preceded by a headache severe enough to require morphine. X-ray therapy directed toward the head, I am told, may cause some increase temporarily in intracranial pressure, but I think that a headache of this order is most unusual as a result of local x-ray therapy. Of course there was an extensive lesion in the nasopharynx, and possibly secondary infection. On the other hand, in view of the subsequent events, we wonder if this headache may have had another basis. Shortly thereafter, — we do not know exactly how soon, — this patient abruptly went into collapse, with severe pain in the right shoulder, which suggests to me either a pleural origin from the right upper portion of the lung or referred pain from the diaphragmatic pleura.

There are two possible explanations for this final fatal episode which appeal to me. On the basis of the data given in the record, lymphomatous infiltration of the pericardium and heart seems least likely of the two possibilities, both because of the abruptness of the acute episodes with associated severe pain and because of the nature of the final attack. I suppose it is possible that a pericardial effusion may have been developing and escaped detection. It is sometimes very difficult to detect even a large pericardial effusion, especially if it is located posteriorly and not suspected. It would be somewhat difficult on the basis of a diagnosis of final cardiac tamponade secondary to pericardial effusion to explain the abrupt severe pain in the right shoulder. Cardiac tamponade from pericardial effusion is usually not a very painful event. It is possible, I suppose, that this patient may have had some associated coronary insufficiency, but it seems to me again very unlikely that the terminal event was related to failure of the coronary circulation. It does seem to me possible and perhaps the more likely of the two possibilities that this final illness and the patient's premature death were secondary to recurring pulmonary emboli with pulmonary infarction. One would like to speculate a bit as to the possible source, if this should prove later to be the correct impression. I was impressed by the apparent severity of the headache a day or two before the terminal illness and by the initial episode following a certain amount of manipulation of the head and cervical region, and I am wondering if a deep cervical phlebitis or a phlebitis of the veins at the base of the skull might not have been the source. In conclusion I suggest, as my first choice of the above two possibilities, that this patient had lymphoma of the nasopharynx and recurrent pulmonary emboli with infarction and possibly terminal acute cor pulmonale.

Dr. Paul D. White: I have nothing to say except that we see very rare cases of tumor that involve the heart and pericardium with signs and symptoms that are indistinguishable from other types of heart disease, for example coronary disease.

Clinical Diagnoses

Reticulum-cell sarcoma of nose.
Coronary occlusion.

Dr. Bland's Diagnoses

Lymphoma of nasopharynx.
Pulmonary emboli and infarction.
Acute cor pulmonale?

Anatomical Diagnoses

Reticulum-cell sarcoma of nasopharynx, mediastinum, pericardium, myocardium, adrenal glands and kidneys.
Hemopericardium.
Pulmonary congestion and edema.
Operative scar: suprapubic prostatectomy.

Pathological Discussion

Dr. Mallory: On the wards it was assumed that there was a cardiac complication in this case and in all probability that it was coronary occlusion. The determination of the exact mechanization of death is often extremely difficult, either clinically or anatomically, and there remain a very large number of cases in which we totally fail to do so.

We found that the lymphomatous process was much more extensive than had been suspected clinically. Not only did it involve the ethmoid sinuses and nares but there was extensive mediastinal disease, involvement of the adrenal glands and kidneys, and a massive involvement of the pericardium and of the heart itself. There was a fibrinous pericarditis but no pleuritis, so I think that the friction sound was a true pericardial rub. The major portion of the left ventricle and a large portion of the right showed massive tumor infiltration, and the coronary arteries appeared to be considerably narrowed by external pressure of tumor in the epicardium, but were nowhere occluded; and there were no thrombi. The brain was negative and I have no anatomical grounds on which to explain the headache. I should simply raise the point that it is not in-

frequent to see considerable edematous swelling of a tumor immediately following x-ray treatment, and I think swelling of tumor in the region of the ethmoid sinuses might have accounted for the sudden accession of pain. The sudden and marked swelling of a tumor following radiation is of most practical importance in relation to the treatment of lymphoma of the mediastinum. On several occasions where radiation has been given without first putting down a tracheal tube, we have seen sudden death from asphyxiation.

DR. BERNARD M. JACOBSON: Was there anything in the appearance of the heart to suggest that a clue to the true diagnosis might have been supplied if we had had an x-ray film of the chest?

DR. MALLORY: I do not believe it would have made much difference. The mediastinal involvement was great enough to have been observed and one might have guessed an extension from the mediastinum into the pericardium, but I do not believe one could have differentiated pericardial involvement and cardiac involvement.

DR. JACOBSON: On account of the rather strong likelihood of fresh coronary thrombosis, it was a week or ten days after admission before we thought it was wise to move him to the x-ray treatment room. We still did not feel justified in putting him through a strenuous diagnostic routine.

DR. MALLORY: The most puzzling feature of the case is, Why, with a slowly progressive infiltration of the heart, did the symptoms come on with such dramatic suddenness? I have no explanation for that.

DR. BLAND: I suppose then there was terminal acute cardiac tamponade?

DR. MALLORY: That would be hard to guess about rationally. The amount of fluid in the pericardium was not very large. On the other hand the pericardial wall was unusually thick and stiff.

DR. WHITE: Was it thick all around?

DR. MALLORY: Yes.

CASE 25422

PRESENTATION OF CASE

A fifty-four-year-old married machinist was admitted to the hospital complaining of severe frontal and occipital headaches of a year's duration.

One year before admission, without apparent precipitating cause, the patient first experienced the onset of attacks of dull, boring, frontal headaches, which characteristically moved backward over the course of twenty-four to forty-eight hours to the region of the occiput where they remained for a few hours and then passed away. These headaches were accompanied by some dizziness and impairment of vision and occurred about twice a week. He changed his spectacles, but his symptoms continued. Five weeks after the onset of the headache, the patient consulted his company physician who found a systolic blood pressure of 220 and immediately advised bed rest, with the elimination of salt, spices and meat from his diet. Following this regime for about a month, the blood pressure was somewhat lower and he returned to work. His nocturia meanwhile increased to two to three times per night. He remained at work until two months before admission, although he was troubled by increasingly severe and frequent headaches with dizziness and scotomas. The diet consisted mainly of milk, cereal, bread, fruit and a little water. A few months before entry his blood pressure was 194 systolic and his local physician again advised bed rest. Two to three weeks before entry he became increasingly nervous and nauseated and on one occasion had a spontaneous nosebleed. The patient noted that his headaches were induced and aggravated by fear of losing his job and by other financial and family worries. On the evening before entry while lying in bed he became very dyspneic. His appetite had been only fair during this period of illness, and he had lost about 40 pounds in weight. On occasions he vomited greenish liquid material without blood.

For ten to fifteen years before admission the patient had noted nocturia; he was awakened from sleep once every night and passed a large quantity of urine. Three years before entry he changed his spectacles because of a recession of near vision. He had been constipated for the year prior to entry and had noted numbness and tingling of the fingers for six months. There had been no cough, orthopnea or ankle edema. There was no history of frequent sore throats or scarlet fever.

The family, marital and past histories were otherwise unremarkable.

Physical examination revealed a fairly well-developed and nourished pale man lying flat in bed with little discomfort. He weighed about 135 pounds. The eyes showed bilateral swelling of the disks, with flame-shaped hemorrhages and recent and old exudates in the fundi. A few teeth were carious. The heart was enlarged to the left, 4 cm. beyond the midclavicular line. The sounds were of good quality, with no thrills or murmurs. The rhythm was regular. The blood pressure was 236 systolic, 140 diastolic. There were a few fine cracking rales at the right base. The abdomen was normal.

The temperature was 99.6°F., the pulse 92, and the respirations 20.

Examination of the blood showed a red-cell count of 3,000,000 with 45 per cent hemoglobin, and a white-cell count of 11,000 with 84 per cent polymorphonuclears; the smear showed moderate anisocytosis. The urine was clear with a pH of 6.5, a specific gravity of 1.010, a +++ albumin, no sugar, diacetic acid or bile, and 3 to 5 red cells, 3 to 5 white cells and many granular and hyaline casts per high-power field. The serum calcium was 9.69 mg. per 100 cc., the phosphorus 3.64 mg., the phosphatase 6.28 units, and the nonprotein nitrogen 75 mg. A blood Hinton test was negative. A phenolsulfonephthalein excretion test showed 2 per cent in fifteen minutes and a total of 7 per cent in an hour. A lumbar puncture showed an initial pressure of 350 mm. of water. The fluid was clear and colorless, and the dynamics normal; the total protein was 75 mg. per 100 cc. An electrocardiogram showed a ventricular rate of 80, with normal rhythm; the PR interval was 0.15 second; there was a low T_1, with slight left-axis deviation. X-ray study revealed that the heart shadow showed only slight prominence in the region of the left ventricle; the aorta was tortuous but not dilated. The lung fields were clear.

The patient was given up to 3500 cc. of fluids daily and a salt-poor, low-protein (40 gm.) diet. In spite of the high fluid intake the daily urinary output ranged from 500 to 800 cc. The blood pressure remained about the same. He began vomiting, and the nonprotein nitrogen rose to 90 mg. per 100 cc. He quickly went downhill, became comatose and expired on the seventh hospital day.

Differential Diagnosis

Dr. Wilfrid J. Comeau: The picture which this case presents seems to be one in which the kidneys unquestionably play the dominant role. The heart, although affected, is a secondary factor and of minor significance insofar as the major symptoms are concerned. With regard to the heart, you will note that he had had one attack of nocturnal dyspnea, and it is fair, I believe, to consider this an attack of left ventricular failure. To go with this he had hypertension, left ventricular enlargement and slight electrocardiographic changes. The attack of dyspnea occurred a week before he died, and I am quite sure that if he had lived long enough the cardiac symptoms would have become more prominent. The x-ray film of his heart shows less enlargement than one might expect, but there is some congestion of the hilar shadows, which indicates early pulmonary congestion. The electrocardiogram shows a low, sometimes slightly diphasic T_1 and left-axis deviation; the other T waves are of good amplitude. These changes indicate a slight degree of myocardial disease.

Classical symptoms and signs indicate that the kidneys were the primary cause of this man's illness and death. There was marked hypertension with retinopathy and encephalopathy; and in addition there were anemia, urinary findings which are consistent with kidney failure, a high spinal-fluid pressure indicating cerebral edema, and finally, a rising nonprotein nitrogen with the terminal clinical picture of uremia.

When one makes up his mind that an illness is due to chronic kidney disease and renal failure he is usually presented with an academic problem in differential diagnosis. I say an "academic problem" because the symptoms and signs and treatment of terminal chronic renal disease are more or less identical no matter what the cause may be. One can usually determine whether an individual has chronic kidney disease, but it is often very difficult to decide as to the etiologic background. As a rule, the two things which help most are the history and the clinical course.

In chronic kidney disease one usually considers three etiologic conditions. One is chronic pyelonephritis. It is only within the past few years that people have begun to realize that a former kidney infection, such as a pyelitis, is not necessarily a temporary and innocuous condition. Occasionally this initial attack which clears up clinically and is passed off as cured, progresses subclinically to the stage of chronic kidney disease. There is no evidence to indicate such an etiology here.

Chronic glomerulonephritis is a second condition which one considers. Here again the history and course are important in differential diagnosis. In this case there is no history of acute glomerulonephritis, of scarlet fever or of frequent sore throats, and there is no evidence that the patient went through the nephrotic stage of a glomerulonephritis. Hence, there is no clue suggesting glomerular nephritis as the etiologic factor.

Third, we have benign nephrosclerosis, which is associated with essential hypertension. We do know that he had had hypertension for a year, probably longer. In such cases one generally obtains a history of a long period of hypertension and the level of blood pressure is usually not so high as it was in this case. One can thus see that the differentiation between pyelonephritis, glomerulonephritis and benign nephrosclerosis is very often difficult unless one can get a very

complete history or has a record of the clinical course.

In this case, however, there is definite evidence that no one of these three factors, at least clinically, was the cause of his final demise. Here we have a short course, certainly a year, possibly two or three years. There was marked hypertension. The diastolic pressure is very rarely as high as 140 in benign nephrosclerosis. In the three conditions which I have mentioned previously there may be some retinopathy, but rarely however is it as marked as it was in this case, with edema of the disks and evidence of recent and old hemorrhages. It happens that this man took the path of uremia; he might just as well have taken that of heart failure or of a cerebral vascular accident. This particular case presents clinical features which differentiate it very definitely from the three former conditions which I have mentioned, that is, the short course, the marked hypertension, the retinopathy and the death in uremia. We are dealing here, it seems to me, with malignant hypertension. We must remember that malignant hypertension is not necessarily an isolated condition. Occasionally an individual may have glomerulonephritis or pyelonephritis with a superimposed malignant nephrosclerosis. More commonly, however, malignant nephrosclerosis is superimposed on the benign type. There is no doubt in my mind that in this case the diagnosis is malignant hypertension, with malignant nephrosclerosis, possibly superimposed on the benign type, hypertensive heart disease and moderate cardiac enlargement. In addition, there is hypertensive encephalopathy and retinopathy.

DR. PAUL D. WHITE: I have nothing to add except to bring up the possibility of small cerebrovascular lesions, which will occur sometimes silently and sometimes with symptoms of headache and eye changes.

DR. COMEAU: I might add that I think it is well known, and Dr. Castleman will probably substantiate me, that arterial changes in benign or malignant hypertension pathologically are not confined to the kidney. Very frequently they are widespread, although the main effect is demonstrated in the kidney.

CLINICAL DIAGNOSES

Chronic glomerulonephritis, with hypertension.
Uremia.

DR. COMEAU'S DIAGNOSES

Malignant arterial hypertension, with malignant nephrosclerosis.
Hypertensive heart disease, with moderate cardiac enlargement.
Hypertensive encephalopathy and retinopathy.
Uremia.

ANATOMICAL DIAGNOSES

Chronic vascular nephritis, malignant phase. (Uremia.)
Cardiac hypertrophy, hypertensive type.
Arteriosclerosis, marked, generalized.
Bronchopneumonia, bilateral.
Pulmonary edema.
Infarction of lenticular nucleus and pons.
Encephalomalacia, generalized.

PATHOLOGICAL DISCUSSION

DR. BENJAMIN CASTLEMAN: At autopsy this man showed an enlarged heart, weighing 450 gm., most of the enlargement being due to hypertrophy of the left ventricle. There was no evidence of heart failure. The kidneys weighed 225 gm., being about two thirds their normal weight. On stripping the capsules, we could see a diffuse coarse granularity, the granules being gray with red depressed areas between them — the characteristic appearance of what has been called a malignant vascular nephritis. Histologically, the majority of the arterioles showed marked medial hyalinization with only occasional necrotizing arteriolitis. The larger vessels showed a hyperplastic intimal proliferation. About half the glomeruli showed partial or complete hyalinization.

A few years ago we were convinced that this disease was a specific entity; that is, that nephrosclerosis could be divided into two groups, the benign and the malignant types. Now we believe that these types are probably different phases of the same disease. A patient can certainly go along with benign hypertension for ten years and suddenly develop signs of renal failure and show anatomic changes that may or may not be typical of malignant vascular nephritis. Moritz* has shown very well that necrotizing lesions can be present in the so-called benign type and may be absent in clinically malignant cases. In the brain there were numerous small areas of softening with true infarction in several places, especially in the pons and the lenticular nucleus.

DR. WHITE: Were the coronaries involved?

DR. CASTLEMAN: They showed a moderate degree of arteriosclerosis but no occlusion. There were arterial changes in the pancreas and spleen, and a fairly extensive terminal bronchopneumonia was present.

*Moritz, A. R., and Oldt, M. R.: Arteriolar sclerosis in hypertensive and non-hypertensive individuals. Am. J. Path. 13:679-728, 1937.

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HARVEY CUSHING

The *Journal* has inscribed with a sense of deep regret the death of Harvey Cushing. His removal from our midst permits us the opportunity to record here the debt of gratitude which civilization in general and medicine in particular owe him. The descendant of a long line of doctors (David Cushing, 1768–1814, Cheshire, Massachusetts; Erastus Cushing, 1802–1893, Berkshire Medical College; Henry K. Cushing, 1827–1910, Cleveland, Ohio), he demonstrated from the beginning an exceptional ambition and ability in our profession. Essentially an aristocrat and a perfectionist, he always evinced the highest sense of obligation to his profession, and if his critical attitude, which tolerated nothing but the best, was difficult for some colleagues from time to time, it was magnificently good for the world at large. Imbued with great vitality and enormous energy, he became the foremost surgeon of his day, a master-teacher, a profound and prolific investigator, and the most accomplished medical writer in our country.

After a complete training in general surgery largely at the Johns Hopkins Hospital where he fell under the beneficent influence of William Stewart Halsted, Dr. Cushing took up, at his teacher's request, the study of the central nervous system as it related to the surgical practice of that day. For the purpose of tilling this field he was equipped with his personal qualities of ambition, intelligence and industry and a technical skill that promised great advances. His contributions to this field gave to medicine the surgical technic requisite for safe exploration of the nervous system and laid down the signposts for the future advancement of knowledge in neurology.

This gift to mankind, however, was but a part of Dr. Cushing's accomplishments. His abiding desire and curiosity to understand completely everything he saw or did led him to become a voracious seeker in medical literature. His intimacy with Sir William Osler quickened and deepened this natural bent into a great love of books. The cultivation of this interest brought about the formation of a great library of the original sources in medicine. He soon became one of the leading medical bibliophiles of his day. But his bibliophilic aspirations were far greater than those of most collectors. In his hands books became really useful; they dropped into the hands of pupils and found their way about. This emphasis and interest in the study of original sources was a major stimulus to his pupils, and not a few men owe their positions and intellectual customs to the habit acquired by this appreciation and love of books.

Naturally Dr. Cushing's explorations, his works and his reading led to new ideas, questions and problems which took him and his pupils and assistants to the laboratory for an answer. His life is an outstanding example of the dictum that work begets ideas. Such great intellectual curiosity and

healthy skepticism led to a series of imposing investigations in experimental surgery and physiology that continuously pushed forward our knowledge of the ductless glands and the central nervous system.

His published articles and books number some three hundred and thirty items. Such voluminous writing bore its undeniable fruit. He became the most accomplished medical writer of his day. Nor to those familiar with his ways did this differ from his technical work or his laboratory investigations. It came through work and his insatiable desire for perfection. No reference was too casual to be neglected or quoted through another's pen or eye — he always saw it himself. The best dictionaries were always at his elbow, and the manuscripts were rewritten and rewritten. In the midst of his busiest years his most revered friend, William Osler, died, and Dr. Cushing gladly assumed the task of writing a biography. In the composition of this masterpiece the same tools and spirit were at work. Files of daily newspapers littered his library for two years, lest any small comment of value be overlooked. There could be no wonder on the part of his intimates when the Pulitzer Prize in Letters was given to him in 1926 for this effort.

Finally and beyond the immense contributions to surgery, science and literature lies the inevitable effect he had on others — his pupils. The brilliance of his works brought young men to him in droves. A casual talk fired the enthusiasm of even the dullards. Once they had secured the opportunity to work with him on his staff the process began. It often started abruptly; it was often difficult; it was never easy. And the education took in all phases. To the beginner, tests which in his mind might have seemed unimportant were magnified; anything in medicine might save life or kill; everything was important and therefore everything had to be perfect, even if it entailed a sleepless night. And it could not be put off. Later in the education came the surgical dressing — it must be neat, it must be comfortable, it might have to be done three times a day. The patient was put in his proper position: he was everything; anything which made him feel better or more at peace in his mind was good, anything to the contrary was bad. There was no room for in-betweens. Delegation of responsibility was never permitted. "So and so is your patient. You must know all about him, all about his family; if necessary to elicit a proper past history, send for the grandmother; try talking to the patient at night, he might like you better then!" It was a hard row, but it was excellent medicine. In Dr. Cushing's hands, medicine was a religion. His pupils knew this, and although they became very tired and sometimes hurt or angry, the clear light was always there. The "Chief" was right.

But it was not only the technic of handling the patient, it was the proper conduct of a doctor in the sick room. Many an assistant — and it mattered not at all how high in the hierarchy of the hospital system he had climbed — was openly berated for addressing a medical student in front of a patient without the title of doctor. And so it led to the operating room. Here the protection of the patient was complete. His comfort on the operating table was of major importance, and the wound a religious ceremony. It is said that only those who went through the experience can appreciate what it was: there the master surgeon was at his best, and technic was a ritual in which no mistakes could be tolerated. Moreover, these procedures revealed most clearly the dominant spirit of perfection. Five, six and even seven hours of gruelling labor were as nothing if the patient might be benefited. And in this effort Dr. Cushing spared himself least of all. No one was ever asked to work harder than he did himself. Very little was said. His example was sufficient. The result of this was seen in all directions; first, the patients recovered; second, his technical procedures were correctly evaluated as works of art. He used instruments as a great violinist uses his bow and was just as careful of them. He left a great heritage to his assistants. He taught them daily the greatest of all truths that by hard work comes success. Out of this labor, and alone, he built the foundations and

much of the structure of neurological surgery, and in so doing made countless patients happy and useful citizens.

It is obvious that Harvey Cushing was an unusual individual, obvious that his driving spirit of perfection coupled with his dynamic energy yielded great fruits. We in New England, the home of his forebears, the happy center where the early part of his formal education took place (Yale College, Harvard Medical School, Massachusetts General Hospital) and the seat where his greatest labors took place (Peter Bent Brigham Hospital), are glad to record here his beneficent influence on the medicine of our time. He has bequeathed to us high principles, and his example in both the art and science of our profession leaves us silent at his feet.

HOW TO CHOOSE YOUR DOCTOR

This subject has exercised the thought and ingenuity of many professional and semiprofessional groups, committees on public education and writers of syndicated health columns. In May, in a mimeographed statement,* the United States Public Health Service issued another attempt to broadcast such helpful information. The formulas have become rather fixed. The first method advised, that of making inquiry of "your own doctor at your last residence, asking him to recommend a practitioner in the new town to which you are going," is feasible only when circumstances permit the doctor to make a first-hand choice, such as that of a personal acquaintance, former classmate or otherwise known person. If such fortuitous circumstances do not exist, apparently one must resort to the directories for information about society memberships, scientific accomplishments and other indirect indices of professional achievement. Lists of such memberships, the possession of which may be presumed to indicate recommendable qualities, are at best cumbersome. As in the Negro spiritual, they provide wheels within wheels. Also as in the song the little wheel goes by Faith, but here the simile ends, for the big wheel unmistakably goes by the Grace of Scholastic Aptitude.

How far can the Grace of Scholastic Aptitude be trusted as a guide to the quality of medical service? To what extent can it be relied on as a measure of judgment, character or professional integrity? The medical schools have been asking themselves these questions for years. They probably have greater misgiving about the answers than any other group within our profession. The medical aptitude test has been devised in an attempt to supply further data. While it has been of considerable aid to those interested in medical education in the appraisal of their future students, the test has on the whole proved to be no more than another measure of general scholastic adaptability, memory or facility of expression. It correlates very closely with the other data collected about prospective students, the highest grades of which lead to the conferring of degrees with honors. Yet low-grade scholars have proved themselves capable of becoming high-grade doctors. One must conclude that there is no diagnostic test for a "good doctor."

Why not assume that the legal requirements for the practice of medicine are reasonably selective in most places, and let the individual concerned, when he is called on to act, make what is known on the diamond as a fielder's choice? If the circumstances in any community are such that this would be a dangerous thing for a newcomer to do, then there exists in that community an extreme public-health emergency. Such emergency needs to be dealt with less by erudition and more by action.

Action of many sorts suggests itself. First the statutory regulations for the practice of medicine should be reviewed. If they are sufficient in authority the spirit of their administration must be scrutinized. If that is above reproach their enforcement needs to be assured. If there still is not a sufficient supply of competent doctors the medical institutions in which they are being trained need attention.

The *Journal* would suggest to anyone in a strange community that the local reputations of its doctors are as trustworthy guides as are those of its bankers, merchants and citizens in general.

*_Choosing One's Doctor_. 3 pp. Washington, D. C.: U. S. Public Health Service, 1939.

OBITUARY

GEORGE WASHINGTON WALES BREWSTER

1866–1939

George Washington Wales Brewster died at his home, 213 Beacon Street, Boston, on September 26, in his seventy-third year. He was born in Roxbury, attended the Roxbury Latin School, and graduated from Harvard College in the class of 1889. After his graduation he attended the Harvard Medical School, graduating from there in 1893. In 1900 he was made surgeon to outpatients at the Massachusetts General Hospital. He served as private assistant to Dr. Maurice Richardson for some years. In 1906 he was made assistant surgeon to the Massachusetts General Hospital, and in 1914 visiting surgeon. In 1927, at the completion of twenty-seven years as a surgeon to this hospital he retired from active service and was appointed to the consulting staff.

Dr. Brewster was a member of many medical and surgical societies, including the Boston Surgical Society, the New England Surgical Society and the American Surgical Association. He was a member of the Tavern Club, The Country Club and the Aesculapian Club.

He is survived by his widow, Ellen Hodge Brewster, and three sons, William, George, Jr., and Henry.

Dr. Brewster was of that school of surgeons who were trained before the days of x-ray and laboratory diagnosis, and throughout his life his judgment of sickness — whether to operate or not — was accurate and sound. Because of his surgical instinct his value as a consultant was great. Dr. Brewster loved to operate, loved surgery and kept up his interest to the very last. His visits to his hospital were a delight and an example to the younger staff members and house officers. At the various meetings in the hospital — surgical, medical and pathological — his cheery presence and sane criticism were always welcome.

Great surgeon and great healer as he was he will be missed most by those who knew him well and who benefited by his loyalty, interest and criticism. His advice was sought by all, and the younger men in particular have suffered a loss that they know can never be filled. Bright, quick, caustic, but always fair, he saw through sham and enjoyed exposing it. Instinctively all were drawn to him, and he never failed his friends. Few are the older men who will be honored as he, and great will be anyone who can even partially take his place.

Old people, young people, patients, hospital employees and clubmates will all miss the gruff, but cheery, lovable and distinguished "Old Man."

J. V. M.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY*

RAYMOND S. TITUS, M.D., *Secretary*
330 Dartmouth Street
Boston

SEPTIC ABORTION

Mrs. B. G., a twenty-five-year-old primipara, entered the hospital May 25, 1911. Her last regular menstruation had been in February. On May 20, following a fall down stairs, she began to flow and miscarried that night. She continued to flow and to have abdominal pain; the day before entrance she had a chill.

The family history was not obtained. The patient had had no serious illnesses or operations. Catamenia had begun at fourteen, had a twenty-eight-day cycle, and lasted four days, with slight pain at the onset.

Physical examination showed a well-developed and nourished woman with flushed face and a dry, coated tongue. The temperature was 102°F., the pulse 120 and of good quality. The breasts were enlarged and somewhat congested. The heart sounds were clear and regular. The lungs were clear and resonant throughout. The abdomen was tender in both lower quadrants, but there was no spasm. The uterus was enlarged to the size of a two-months' pregnancy and was soft, symmetrical and non-tender. There was a slight blood-tinged discharge. The vaults were soft and slightly tender, but no masses were felt.

The white-blood-cell count was 16,000, the hemoglobin 75 per cent. The urine was high colored, with a specific gravity of 1.024, a slightest possible trace of albumin and no sugar. The sediment showed red, white and squamous epithelial cells in large numbers.

The patient was kept under observation for twenty-four hours, but as there was no improvement the following day, the cervix was dilated sufficiently under light anesthesia to introduce a finger into the uterus. No embryonic remains were found, and a gauze strip saturated with tincture of iodine was placed in the uterine cavity and left there for six hours.

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

The patient was given hot vaginal douches of boric solution daily and placed out-of-doors. For nine days after entrance the temperature ranged from 101 to 104°F., and the pulse from 100 to 128, the average being between 110 and 120. On the tenth day the temperature abruptly came down to normal and remained so until discharge.

Discharge examination showed the uterus to be normal in size and slightly retroverted; the vaults were negative. The patient left the hospital on June 12.

Comment. The treatment of this case represents unusual conservatism for the year 1911. Some men at that date made curettage a routine procedure in septic abortion. We have learned that this is harmful; today the treatment would have been even more conservative. In the absence of actual bleeding the uterus would not have been invaded except for the purpose of getting a culture, and blood cultures would also have been obtained; if one or both of these cultures had been positive, chemotherapy might have been instituted. The use of antiseptics in the uterine cavity has proved of no value. This patient recovered when her powers of resistance improved sufficiently to overcome the infection. The outdoor treatment undoubtedly helped.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning October 23:

BARNSTABLE

Sunday, October 29, at 4:00 p.m., at the Cape Cod Hospital, Hyannis. Subject — The Use of Drugs in the Treatment of Childhood Infections. Instructor: Charles F. McKhann. Donald E. Higgins, *Chairman*.

BRISTOL NORTH

Thursday, October 26, at 4:00 p.m., at the Morton Hospital, Taunton. Subject — Syphilis in Pregnancy and the Offspring. Instructor: Francis M. Thurmon. Lester E. Butler, *Chairman*.

BRISTOL SOUTH (New Bedford Section)

Friday, October 27, at 4:00 p.m., at St. Luke's Hospital, New Bedford. Subject — The Use of Biological Preparations in Pediatric Practice. Instructor: Louis K. Diamond. Robert H. Goodwin, *Chairman*.

ESSEX NORTH

Friday, October 27, at 4:30 p.m., at the Lawrence General Hospital, Lawrence. Subject — Gonorrhea in the Female. Instructor: Alonzo K. Paine. John Parr, *Chairman*.

ESSEX SOUTH

Tuesday, October 24, at 4:00 p.m., in the Conference Room of the Salem Hospital, Salem. Subject — Pneumonia. Instructor: W. Barry Wood, Jr. J. Robert Shaughnessy, *Chairman*.

MIDDLESEX EAST

Tuesday, October 24, at 4:00 p.m., at the Melrose Hospital, Melrose. Subject — Common Problems of Neurology: Indications for lumbar puncture. Instructor: H. Houston Merritt. Walter H. Flanders, *Chairman*.

MIDDLESEX NORTH

Friday, October 27, at 4:45 p.m., at St. John's Hospital, Lowell. Subject — Indications for Cesarean Section. Instructor: Robert L. DeNormandie. William S. Lawler, *Chairman*.

WORCESTER DISTRICT (Milford Section)

Tuesday, October 24, at 3:30 p.m., in the Nurses' Home of the Milford Hospital, Milford. Subject — Gonorrhea in the Female. Instructor: Oscar F. Cox, Jr. Joseph Ashkins, *Chairman*.

WORCESTER DISTRICT (Worcester Section)

Friday, October 27, at 8:00 p.m., in the Staff Room of the Worcester City Hospital, Worcester. Subject — Cardiovascular Disease: Eleven important questions about heart disease and their answers. Instructor: Sylvester McGinn. George C. Tully, *Chairman*.

WORCESTER NORTH DISTRICT

Friday, October 27, at 4:30 p.m., in the Nurses' Home of the Burbank Hospital, Fitchburg. Subject — The Use of Biological Preparations in Pediatric Practice. Instructor: Warren R. Sisson. George P. Keaveny, *Chairman*.

APPLICANTS FOR FELLOWSHIP

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BERKSHIRE DISTRICT

BOWMAN, ROSE M. Z., 1350 Massachusetts Avenue, North Adams.
Middlesex College of Medicine and Surgery, 1932.

BOWMAN, WILLIAM E., 1350 Massachusetts Avenue, North Adams.
Middlesex College of Medicine and Surgery, 1931.

DURANT, RICHARD C., 116 West Avenue, Great Barrington.
Harvard Medical School, 1934.

MARNELL, THOMAS F., 314 Main Street, Great Barrington.
Missouri College of Medicine and Science, 1927.

PARTINGTON, PHILIP R., 100 Maple Avenue, Great Barrington.
Columbia University, College of Physicians and Surgeons, 1934.

VOHR, DOROTHY L., 28 Park Street, Lee.
Middlesex College of Medicine and Surgery, 1933.

George S. Reynolds, *Secretary*.

BRISTOL NORTH DISTRICT

COLMAN, JOSEPH H., 96 Rumford Avenue, Mansfield.
Tufts College Medical School, 1936.

FIMAN, CHARLES E., Taunton State Hospital, Taunton.
College of Medical Evangelists, 1938.

JOHNSON, PAUL E., Bristol County Tuberculosis Hospital, Attleboro.
Tufts College Medical School, 1936.

MULHERN, JOHN F., JR., 29 Spring Street, Taunton.
Tufts College Medical School, 1937.

WHITE, EARL R., 119 County Street, Attleboro.
Tufts College Medical School, 1919.

William H. Swift, *Secretary.*

BRISTOL SOUTH DISTRICT

MANLEY, JAMES S., 91 Mill Street, New Bedford.
Tufts College Medical School, 1935.

ORLOV, SAMUEL, 341 Main Street, Wareham.
Tufts College Medical School, 1932.

Albert H. Sterns, *Secretary.*

ESSEX NORTH DISTRICT

BLAISDELL, JOHN W., Lawrence General Hospital, Lawrence.
Tufts College Medical School, 1939.

BRADLEY, JOSEPH A., 8 Stearns Avenue, Lawrence.
Tufts College Medical School, 1939.

BREMNER, ROBERT M., Lawrence General Hospital, Lawrence.
Boston University School of Medicine, 1939.

CONDO, ANNUNZIATO, 110 Summer Street, Lawrence.
Royal University of Medicine and Surgery, Naples, 1922.

DAWSON, RAYMOND J., 50 Brown Street, Methuen.
McGill University Faculty of Medicine, 1933.

DE NUCCIO, ADOLPH A., 53 Oak Street, Lawrence.
Boston University School of Medicine, 1938.

ODDY, PARKINSON L., 12 Quincy Street, Methuen.
Middlesex College of Medicine and Surgery, 1932.

Harold R. Kurth, *Secretary.*

ESSEX SOUTH DISTRICT

COLLINS, JAMES F., 853 Washington Street, Gloucester.
Tufts College Medical School, 1937.

CROWLEY, JOHN J., 65 Broad Street, Lynn.
Harvard Medical School, 1934.

MCCARTHY, RALPH P., 3 Park Street, Peabody.
Georgetown University School of Medicine, 1936.

MEHAN, MONA C., Danvers State Hospital, Hathorne.
Woman's Medical College of Pennsylvania, 1936.

O'BRIEN, THOMAS E., 78 Hawthorne Street, Lynn.
Tufts College Medical School, 1936.

O'NEILL, JOHN J., 386 Lafayette Street, Salem.
Kansas City University of Physicians and Surgeons, 1933.

PETT, MORRIS H., 54 Middle Street, Gloucester.
Middlesex College of Medicine and Surgery, 1930.

RISMAN, JOSEPH, 437 Western Avenue, Lynn.
University of Vermont College of Medicine, 1937.

SENECAL, ALPHONSE L., Colon Street, Beverly.
McGill University Faculty of Medicine, 1933.

SMITH, EDWIN A., 23 Broad Street, Lynn.
Tufts College Medical School, 1938.

SULLIVAN, FRANCIS X., Danvers State Hospital, Hathorne.
Tufts College Medical School, 1938.

J. Robert Shaughnessy, *Secretary.*

FRANKLIN DISTRICT

FLO, SPENCER C., 15 James Street, Greenfield.
University of Michigan Medical School, 1931.

Charles Moline, *Secretary.*

HAMPDEN DISTRICT

ANDERSON, LEONARD E., 101 Dover Road, Longmeadow.
University of Michigan Medical School, 1930.

BERSACK, SOLOMON R., 46 Forest Park Avenue, Springfield.
University and Bellevue Hospital Medical College, 1935.

CAIA, PASQUALE C., 3048 Main Street, Springfield.
Tufts College Medical School, 1934.

CARBONE, JOSEPH A., 46 Forest Park Avenue, Springfield.
Rush Medical College of the University of Chicago, 1934.

CLEVELAND, HAROLD F., 462 Belmont Avenue, Springfield.
Middlesex College of Medicine and Surgery, 1920.

COGAN, MICHAEL A., 13 Willow Street, Holyoke.
Vanderbilt University School of Medicine, 1936.

DEE, JOHN F., 156 Main Street, Indian Orchard.
Boston University School of Medicine, 1938.

DINEEN, JOHN B., 521 Liberty Street, Springfield.
Georgetown University School of Medicine, 1933.

GINSBURG, DAVID, 218 Pearl Street, Springfield.
Mid West Medical College, 1934.

HOLLERAN, HAROLD J., Spruce Street, Westfield.
Tufts College Medical School, 1933.

JORCZAK, JOHN S., 250 School Street, Chicopee.
College of Physicians and Surgeons, Boston, 1931.

LEWIS, JAMES, State Sanatorium, Westfield.
Harvard Medical School, 1933.

MAZER, MENDEL, 25 Marengo Park, Springfield.
Columbia University, College of Physicians and Surgeons, 1935.

OSGOOD, RUDOLF, Monson State Hospital, Palmer.
Rush Medical College of the University of Chicago, 1932.

SHERMAN, DAVID E., 447 Sumner Avenue, Springfield.
Middlesex College of Medicine and Surgery, 1930.

SMITH, LEONARD, 2 Mill Street, Westfield.
Middlesex College of Medicine and Surgery, 1930.

STEELE, GEORGE C., 39 Church Street, West Springfield.
Harvard Medical School, 1937.

TEAHAN, WILLIAM W., 57 Nonotuck Street, Holyoke.
University of Pennsylvania School of Medicine, 1936.

WILSON, CARL, 68 Fort Pleasant Avenue, Springfield.
University of Virginia Department of Medicine, 1935.

Wayne C. Barnes, *Secretary.*

HAMPSHIRE DISTRICT

KOWALSKI, JOSEPH V., 67 South Street, Ware.
Middlesex College of Medicine and Surgery, 1934.

PEKALA, JOSEPH G., 261 Main Street, Northampton.
University of Vermont College of Medicine, 1932.

Joseph D. Collins, *Secretary.*

MIDDLESEX EAST DISTRICT

JOY, GENEVIEVE L., New England Sanitarium, Melrose.
College of Medical Evangelists, 1937.

KLAINER, MAX J., 75 William Street, Stoneham.
Boston University School of Medicine, 1937.

MICHELSEN, JOST J., 15 Grove Street, Winchester.
University of Berlin, 1928.

Kenneth L. Maclachlan, *Secretary.*

MIDDLESEX NORTH DISTRICT

BRYANT, MASON D., JR., 31 Harvard Street, Lowell.
Tufts College Medical School, 1939.

CORCORAN, JOHN J., St. Joseph's Hospital, Lowell.
Tufts College Medical School, 1939.

DAMIANI, CLITO R., St. Joseph's Hospital, Lowell.
Tufts College Medical School, 1939.

DUGGAN, GEORGE L., 388 High Street, Lowell.
Georgetown University School of Medicine, 1936.

HOULE, EMILE A., 14 Mt. Washington Street, Lowell.
Boston University School of Medicine, 1938.

LAUGHRAN, JAMES F., St. John's Hospital, Lowell.
Tufts College Medical School, 1938.

LAURIN, THEOPHILE, 169 Parkview Avenue, Lowell.
Baltimore University School of Medicine, 1895.
University of Bishop College Faculty of Medicine, Montreal, 1899.

SHLOSSBERG, FRANK, 194 Westford Street, Lowell.
Dalhousie University Faculty of Medicine, 1936.

WOLF, WILLIAM, 501 Andover Street, Lowell.
Tufts College Medical School, 1937.

Edward A. Payne, *Secretary.*

MIDDLESEX SOUTH DISTRICT

ADAMS, RALPH H., 41 Kirkland Street, Cambridge.
Harvard Medical School, 1933.

BARKER, ROBERT H., 45 White Oak Road, Waban.
Harvard Medical School, 1934.

BLOOM, PHILIP, 49 Cross Street, Somerville.
Missouri College of Medicine and Science, 1927.

BUDDINGTON, WESTON T., 125 Langdon Street, Newton.
Harvard Medical School, 1929.

CASS, LEO J., 159 Hancock Street, Cambridge.
Harvard Medical School, 1938.

CONWAY, CHRISTOPHER C., Malden Hospital, Malden.
Tufts College Medical School, 1937.

COOPER, PHILIP, 262 Corey Road, Brighton.
Harvard Medical School, 1934.

FORZIATI, ANTHONY A., 113 Ferry Street, Everett.
Middlesex College of Medicine and Surgery, 1932.

FRIEDBERG, ISADORE H., 1715 Commonwealth Avenue, Brighton.
Tufts College Medical School, 1937.

GIBSON, JOHN G., 2D, 42 Walker Street, Cambridge.
Harvard Medical School, 1932.

GORNEY, ARTHUR J., 125 Ward Street, Chestnut Hill.
Tufts College Medical School, 1935.

GRACE, SYDNEY, Cambridge City Hospital, Cambridge.
Boston University School of Medicine, 1936.

HIRTLE, RALPH B., 37 Main Street, Malden.
Harvard Medical School, 1936.

JACOBS, PERRY H., 16 Pope Street, Hudson.
Middlesex College of Medicine and Surgery, 1933.

JANEWAY, CHARLES A., South Avenue, Weston.
Johns Hopkins University School of Medicine, 1934.

KEVORKIAN, JOHN J., 104 Mt. Auburn Street, Watertown.
College of Physicians and Surgeons, Boston, 1934.

MARKEY, HILDA, 1238 Commonwealth Avenue, Allston.
University of Toronto Faculty of Medicine, 1937.

O'BRIEN, THOMAS J., 6 Main Street, Hudson.
Tufts College Medical School, 1914.

OLANS, SIDNEY, 57 College Avenue, Somerville.
Boston University School of Medicine, 1937.

ROSENHEIM, FREDERICK, 20 Oak Street, Belmont.
Columbia University, College of Physicians and Surgeons, 1929.

SULLIVAN, GARRETT L., JR., 51 Reservoir Street, Cambridge.
Harvard Medical School, 1934.

VANCE, L. ALEXANDER, 3 Langdon Square, Cambridge.
University of Virginia Department of Medicine, 1935.

WEINTRAUB, DAVID, 218 Foster Street, Brighton.
McGill University Faculty of Medicine, 1931.

WHELAN, EDMUND L., Malden Hospital, Malden.
Tufts College Medical School, 1938.

WRIGHT, REBEKAH, 163 Hillside Avenue, Arlington.
Northwestern University Woman's Medical School, 1896.

Alexander A. Levi, *Secretary.*

NORFOLK DISTRICT

AIETA, JOSEPH, JR., 8 Barry Park, Dorchester.
Boston University School of Medicine, 1936.

ALLENDORF, FRANCIS J., 118 Common Street, Walpole.
Middlesex College of Medicine and Surgery, 1933.

ANDOSCA, JOHN B., 249 River Street, Mattapan.
Royal College of Physicians and Surgeons, London, 1934.

AUFRANC, OTTO E., 60 Egmont Street, Brookline.
Harvard Medical School, 1934.

BEIGELMAN, HERMAN, 23 Waumbeck Street, Roxbury.
Tufts College Medical School, 1937.

BRENNER, CHARLES, 185 Winthrop Road, Brookline.
Harvard Medical School, 1935.

BRINES, JOHN K., 29 Martin Road, Wellesley.
Harvard Medical School, 1936.

BROOKS, OSCAR D., 401 Boylston Street, Brookline.
Middlesex College of Medicine and Surgery, 1930.

BUSH, CHARLES W., JR., 293 Eliot Street, Milton.
Boston University School of Medicine, 1936.

CHEEVER, FRANCIS S., 828 Washington Street, Wellesley.
Harvard Medical School, 1936.

COHEN, JACK D., 10 Fuller Street, Brookline.
Tufts College Medical School, 1937.

COLCOCK, BENTLEY P., 50 Jamaicaway, Jamaica Plain.
University of Pennsylvania School of Medicine, 1933.

DICKSON, ELLSWORTH J. M., 888 Great Plain Avenue, Needham.
Tufts College Medical School, 1912.

DYNES, JOHN B., 11 Tetlow Street, Boston (Roxbury).
Harvard Medical School, 1932.

FORBES, ANNE P., 3041 Adams Street, Milton.
Columbia University, College of Physicians and Surgeons, 1936.

FROMER, JOHN L., 62 Marion Street, Brookline.
New York University College of Medicine, 1932.

GIDDON, ELLIOT D., 77 Gibbs Street, Brookline.
Boston University School of Medicine, 1936.

GROSSMAN, SAMUEL, 32 Wenonah Street, Roxbury.
Kansas City University of Physicians and Surgeons, 1932.

HISCOCK, MABELLE C., New England Hospital for Women and Children, Roxbury.
Johns Hopkins University School of Medicine, 1935.

HOOPER, LANGDON, 51 Clovelly Road, Wellesley Hills.
Harvard Medical School, 1937.

HUBER, WILLIAM McP., 1863 Beacon Street, Brookline.
University of Pennsylvania School of Medicine, 1930.

LAMB, GORDON R., 144 Grove Street, Brookline.
University of Michigan Medical School, 1933.

LATHROP, FRANK D., 144 Grove Street, Brookline.
University of Michigan Medical School, 1934.

LINDBERG, THEODORE F., 591 Morton Street, Dorchester Center.
Northwestern University Medical School, 1930.

MORIARTY, JAMES E., 1074 South Street, Roslindale.
Middlesex College of Medicine and Surgery, 1933.

MORSE, FRANK P., JR., 2 Perkins Manor, Perkins Street, Jamaica Plain.
Tufts College Medical School, 1936.

NICHOLSON, MORRIS J., 306 Riverway, Roxbury.
University of Maryland School of Medicine, 1936.

REUTER, ROBERT J., 370 Longwood Avenue, Boston (Roxbury).
Marquette University School of Medicine, 1936.

ROMANO, JOHN, 333 Longwood Avenue, Boston (Roxbury).
Marquette University School of Medicine, 1934.

SALTER, WILLIAM T., 1 Lancaster Lane, Milton.
Harvard Medical School, 1925.

SCHULTZ, PHILIP E., 370 Longwood Avenue, Boston, (Roxbury).
Creighton University School of Medicine, 1933.

SILBERT, NATHAN E., 12 Wildwood Street, Dorchester.
Kansas City University of Physicians and Surgeons, 1933.

SOUDERS, CARLTON R., 50 Jamaicaway, Jamaica Plain.
Harvard Medical School, 1933.

STAPLES, O. SHERWIN, 136 Milton Avenue, Hyde Park.
Harvard Medical School, 1935.

THORNTON, JOSEPH P., 87 Adams Street, Dorchester.
Boston University School of Medicine, 1936.

VASTINE, MARY F., 329 Longwood Avenue, Boston, (Roxbury).
Woman's Medical College of Pennsylvania, 1934.

WAGNER, RICHARD, 197 Longwood Avenue, Brookline.
Medical Faculty of the University of Vienna, 1912.

WEKSTEIN, ABRAHAM J., 1331 Blue Hill Avenue, Mattapan.
Middlesex College of Medicine and Surgery, 1934.

WEXLER, JACOB, 967 Blue Hill Avenue, Dorchester.
Middlesex College of Medicine and Surgery, 1933.

ZALVAN, JACOB, 175 Exchange Street, Millis.
Middlesex College of Medicine and Surgery, 1934.

Frank S. Cruickshank, *Secretary.*

NORFOLK SOUTH DISTRICT

CHIMINELLO, FRANK J., 18 Vine Avenue, Quincy.
Boston University School of Medicine, 1939.

FRANKMAN, WILLIAM, 736 Hancock Street, Quincy.
St. Louis College of Physicians and Surgeons, 1921.

PHILBROOK, F. RANDOLF, 528 North Main Street, Randolph.
Boston University School of Medicine, 1935.

SARGENT, MORGAN, 24 Whitney Road, Quincy.
Yale University School of Medicine, 1937.

SLEMONS, MARION L., 29 Greenleaf Street, Quincy.
University of Michigan Medical School, 1936.

Robert L. Cook, *Secretary.*

PLYMOUTH DISTRICT

BERGMAN, MACKS L., State Farm.
University of Vermont College of Medicine, 1936.

LUDLOW, WILLIAM V., 4 Jericho Road, Scituate.
Tufts College Medical School, 1937.

MACLAUGHLIN, CHARLES H., State Farm.
Tufts College Medical School, 1936.

WASSERMAN, MITCHELL, 42 South Main Street, Marshfield.
Boston University School of Medicine, 1936.

Howard C. Reed, *Secretary.*

SUFFOLK DISTRICT

COGGESHALL, HOWARD C., 10 Pinckney Street, Boston.
Indiana University School of Medicine, 1932.

COHEN, SAMUEL L., 44 Phillips Street, Boston.
Boston University School of Medicine, 1937.

DEVINE, JOSEPH W., 773 Broadway, South Boston.
College of Physicians and Surgeons, Boston, 1931.

DERHAGOPIAN, ARDASHES P., 35 Crescent Avenue, Chelsea.
Tufts College Medical School, 1937.

ELIA, ANDREW D., 362 Commonwealth Avenue, Boston.
Boston University School of Medicine, 1935.

FROTHINGHAM, JOSEPH R., 157 Bay State Road, Boston.
Harvard Medical School, 1937.

HIRSCH, OSKAR, 400 Commonwealth Avenue, Boston.
Vienna University, 1902.

HYMAN, MAYER, The Myles Standish, Beacon Street, Boston.
Rush Medical College of the University of Chicago, 1937.

KUNKEL, PAUL, Boston City Hospital, Boston.
Washington University School of Medicine, 1934.

LINDEMANN, ERICH, 222 Beacon Street, Boston.
University of Giessen, 1924.

MANGANELLI, CHARLES V., 110 Marginal Street, East Boston.
Tufts College Medical School, 1938.

ROIFF, HARRY S., 159 Shurtleff Street, Chelsea.
St. Louis College of Physicians and Surgeons, 1923.

SEWALL, KENNETH W., 64 Charlesgate East, Boston.
Harvard Medical School, 1934.

WARREN, RICHARD, 112 Beacon Street, Boston.
Harvard Medical School, 1934.

WIENER, HARRY J., 51 Nahant Avenue, Revere.
University of Michigan Medical School, 1936.

M. Henry Clifford, *Secretary.*

WORCESTER DISTRICT

CARLETON, THOMAS M., West Main Street, Brookfield.
Tufts College Medical School, 1938.

CONSTANTIAN, HAROLD M., 39 Burncoat Street, Worcester.
Long Island College of Medicine, 1937.

FULDER, HANS, 10 Cottage Street, Worcester.
University of Lausanne, Switzerland, Medical School, 1934.

GARIÉPY, ALONZO J. A., Summer Street, Barre.
Tufts College Medical School, 1935.

GRAINGER, JAMES E., 981 Pleasant Street, Worcester.
Tufts College Medical School, 1938.

HADDAD, ARTHUR K., Worcester City Hospital, Worcester.
Tufts College Medical School, 1937.

LENTINO, JOSEPH W., 85 Walnut Street, Clinton.
Royal University of Rome Medical School, 1934.

REMY, SYLVIO B., 3 May Street, Webster.
Georgetown University School of Medicine, 1937.

ROSENBLUM, HARRY A., Fiskdale.
Kansas City University of Physicians and Surgeons, 1932.

SCOLA, JOSEPH A., 508 Salisbury Street, Worcester.
Middlesex College of Medicine and Surgery, 1931.

George C. Tully, *Secretary.*

WORCESTER NORTH DISTRICT

BRINEGAR, WILLARD C., Gardner State Hospital, East Gardner.
University of Nebraska College of Medicine, 1937.

BRONSON, BENJAMIN, 137 Marble Street, Athol.
Middlesex College of Medicine and Surgery, 1925.

GROSSMAN, MYER J., 599 Main Street, Athol.
Middlesex College of Medicine and Surgery, 1933.

LAPIERRE, J. CHARLES, 21 Waverly Street, Fitchburg.
University of Montreal Faculty of Medicine, 1922.

MATTIA, ANTHONY F., 97 Summer Street, Fitchburg.
College of Physicians and Surgeons, Boston, 1921.

SILVER, JOSEPH M., 46 Prichard Street, Fitchburg.
Middlesex College of Medicine and Surgery, 1933.

WASSER, LOUIS, Elm Street, Baldwinsville.
Middlesex College of Medicine and Surgery, 1933.

Edward A. Adams, *Secretary.*

DEATHS

DOHERTY — HENRY L. DOHERTY, M.D., of Stoughton, died October 9. He was in his forty-sixth year.

Born in Stoneham, he attended Boston College and received his degree from the Harvard Medical School in 1920. He started practice in Stoughton in 1922. Dr. Doherty was a director of the Stoughton Hospital and associate physician at the Norwood Hospital. He held memberships in the Massachusetts Medical Society and the American Medical Association.

His widow, a daughter and three sons survive him.

LEARY — WILLIAM C. LEARY, M.D., of Springfield, died October 13. He was in his seventy-first year.

Dr. Leary attended Holy Cross College and received his degree from the Bellevue Hospital Medical College in 1894.

He was a fellow of the Massachusetts Medical Society and the American Medical Association, and was on the staff of the Mercy Hospital, Springfield.

GREEN LIGHTS TO HEALTH

OCTOBER — NOVEMBER — DECEMBER

SPONSORED BY THE MASSACHUSETTS MEDICAL SOCIETY AND THE MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

COURTESY WAAB — WEDNESDAYS, 4:00 P.M.

October 25. National Hearing Week. Philip E. Meltzer.
November 1. Care of the Eyes. Walter B. Lancaster.
November 8. Heart Disease in Middle Life. Howard B. Sprague.
November 15. Indigestion and How to Treat It. Edward S. Emery, Jr.
November 22. Varicose Veins. Reginald H. Smithwick.
November 29. High Blood Pressure. Robert S. Palmer.
December 6. The Family Physician. David Cheever.
December 13. Nervous Fatigue. Kenneth J. Tillotson.
December 20. Hygiene of the Digestive Tract. Allen G. Brailey.
December 27. Hospitals. Nathaniel W. Faxon.

NEW HAMPSHIRE MEDICAL SOCIETY

DEATH

ALLEN — WALTER A. ALLEN, M.D., of Hampstead, died suddenly at Haverhill, Massachusetts, on August 23.

Dr. Allen was born on January 10, 1869, in Boston, the son of George Allen and Sarah Ann (Collins) Allen, of Hampstead. He graduated in 1889 from Phillips Exeter Academy and in 1892 from Dartmouth Medical School.

He served on the Hampstead School Board for three years and for many years was on the Board of Health. He was chosen representative for two terms, and was a state senator in 1905 and 1906. Dr. Allen was a member of the American Medical Association, of the New Hampshire, Rockingham County and Pentucket medical societies and of the Haverhill Medical Club. During the World War he served in the U. S. Army Medical Corps with the rank of captain.

Dr. Allen is survived by his widow, Mrs. Grace A. Allen.

HENRY H. AMSDEN, *Necrologist,*
New Hampshire Medical Society.

VERMONT STATE MEDICAL SOCIETY

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE NAMES NEW DEAN

The appointment of one of the youngest deans to one of the oldest medical colleges in the United States was recently officially approved by vote of the Board of Trustees of the University of Vermont. The appointee, Dr.

Hardy Alfred Kemp, who has already entered on his new duties, was formerly in charge of the Department of Bacteriology, Hygiene and Preventive Medicine at Baylor University College of Medicine, Dallas, Texas. Born July 13, 1902, at Monett, Missouri, he is just over thirty-seven years old. The University of Vermont College of Medicine is the sixth oldest institution of its kind in the United States. Dean Kemp is perhaps the youngest of medical college deans. Women were first admitted to the college in 1920. The medical curriculum was extensively reorganized in 1937. Since the death of the former dean, Dr. J. N. Jenne, two years ago, the affairs of the institution have been conducted by a committee.

Dean Kemp is perhaps best known for his researches on endemic typhus fever and relapsing fever. In 1934 he won the first award from the Southern Medical Association for his study of relapsing fever. Dean Kemp's work with these two diseases included epidemiological and clinical studies and the development of diagnostic tests.

He received his medical education from St. Louis University School of Medicine, taking his degree in 1926. His internship was spent at the William Beaumont General Hospital, El Paso, Texas.

After a year of private practice at Aurora, Missouri, Dean Kemp spent four months as pathologist in the Missouri State Hospital Service, having charge of the laboratories at the Missouri State Sanatorium at Mt. Vernon. In the fall of 1928 he accepted the associate professorship of bacteriology and hygiene at Baylor University College of Medicine and became full professor in 1937. He was visiting professor of bacteriology at the University of Texas Graduate School, Austin, Texas, during the summer sessions of 1935, 1936, 1937 and 1938, teaching immunology. As lecturer at the Southwestern Institute for Social Workers, under the auspices of the Civic Federations of Dallas and various state and federal agencies, during the winters of 1935, 1936, and 1937 he taught preventive medicine and public-health law.

Dean Kemp is a major in the Medical Reserve Corps of the U. S. Army.

CHANGES IN TEACHING POLICY

Dean Hardy A. Kemp of the medical college of the University of Vermont College of Medicine, speaking recently before members of the Washington County Medical Society, told of some of the changes being instituted in the instruction program of the school.

Among the teaching practices being discontinued are those of preceptorship and undergraduate internships in hospitals throughout the State. For a number of years seniors have been sent out as a part of their instructional program to work with resident physicians in various parts of the State, the idea being to give them practical experience in their coming profession; they also served undergraduate internships in many of the hospitals of the State. This practice will be discontinued, and the work in the state institutions at Waterbury and Pittsford will be curtailed.

Dean Kemp stated that it was with some reluctance that the work was being dropped, but that its discontinuance was necessitated in order to consolidate the work of the students at the college.

Some of the student work being added to the program is a month of obstetric training at the Wesson Maternity Hospital, Springfield, Massachusetts, and a month of urology at the Worcester City Hospital, Worcester, Massachusetts. Arrangements have also been completed, said Dean Kemp, for the full use of clinical facilities at the DeGoesbriand Hospital in Burlington and the Fanny Allen Hospital at Winooski Park.

MISCELLANY

MAINE NEWS

Maine Medical Association

The fall clinical session of the Maine Medical Association will be held at Waterville on October 25 and 26. Headquarters and registration will be at the Elmwood Hotel. The clinics will be held from 9:30 a.m. to 3:30 p.m. at the Central Maine Sanatorium in Fairfield and the Elm City Hospital, Sisters Hospital and Thayer Hospital in Waterville. Dinners and evening meetings will be held at the Elmwood Hotel. The various clinics will be in the nature of dry clinics, ward rounds and demonstrations of cases and x-rays.

Of especial importance are the two evening programs, which have been arranged by the Committee on Graduate Education. Wednesday evening, October 25, there will be a panel discussion on anesthesia. Dr. Howard M. Clute, of Boston, will discuss the subject from the point of view of the surgeon; Dr. M. Fletcher Eades, of Boston, will take up the subject of anesthesia and analgesia in obstetrics; Dr. Sidney C. Wiggin, of Boston, will discuss the general subject; Dr. Gilbert Clapperton, of Lewiston, will speak on the subject from the viewpoint of the small general hospital; and Dr. Paluel J. Flagg, of New York City, will discuss intratracheal anesthesia and asphyxia and will summarize the whole discussion. The evening program for Thursday, October 26, will be held under the auspices of the Kennebec County Medical Association, with Dr. Elliott C. Joslin, of Boston, as speaker.

NOTICES

REMOVAL

Joseph D. Ferrone, M.D., announces the removal of his office to 99 Bay State Road, Boston.

PETER BENT BRIGHAM HOSPITAL

A joint medical and surgical clinic of the Peter Bent Brigham Hospital will be held on Wednesday afternoon, October 25, at 2:00. Drs. Robert M. Zollinger and Soma Weiss will speak on "Vomiting." A clinicopathological conference, conducted by Dr. Elliott C. Cutler, will follow.

On Thursday morning, October 26, at 8:30, there will be a combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital, held at the Children's Hospital. Dr. Frank R. Ober will conduct.

Physicians and students are cordially invited to attend.

Elliott C. Cutler, M.D., *Secretary.*

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held on Tuesday, October 24, in the amphitheater of the Peter Bent Brigham Hospital (Shattuck Street entrance), at 8:15 p.m. Dr. Soma Weiss will preside.

PROGRAM

Presentation of Cases.

Pseudohemoglobin and Related Compounds in Health and Disease. Dr. Otto Shales.

Medical students and physicians are cordially invited to attend.

Robert M. Zollinger, M.D., *Secretary.*

GREATER BOSTON MEDICAL SOCIETY

A meeting of the Greater Boston Medical Society will be held in the auditorium of the Beth Israel Hospital on Tuesday evening, November 7, at 8:15.

Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, will speak on "American Medicine and the National Government."

DAVID B. STEARNS, M.D., *Secretary*.

BOSTON DOCTORS' SYMPHONY ORCHESTRA

The Boston Doctors' Symphony Orchestra will rehearse under Alexander Theide, former concertmaster with the Cleveland Symphony Orchestra and the Philadelphia Symphony Orchestra, two Thursdays at 8:30 p.m., beginning October 19, in Studio A, Station WMEX, 70 Brookline Avenue, Boston. Those interested in becoming members should communicate with Dr. Julius Loman, Pelham Hall Hotel, Brookline (BEA 2430).

MASSACHUSETTS GENERAL HOSPITAL

The next Hospital Research Meeting will be held in the Ether Dome of the Massachusetts General Hospital on Tuesday, October 31, at 5:00 p.m.

PROGRAM

Menopausal Osteoporosis. Dr. Fuller Albright, Miss Esther Bloomberg, Drs. P. H. Smith and H. W. Sulkowitch.

Factors Influencing Ability of Solutions to Dissolve Calcium-Phosphate Structures. Drs. H. W. Sulkowitch, Fuller Albright and Max Rosenheim and Miss Robina Murdock.

Assays of 17 Keto-Sterones in Endocrine Diagnoses and Interpretations. Drs. Russell Fraser, Ann Forbes and Fuller Albright.

HENRY K. BEECHER, M.D., *Secretary*.

NORFOLK DISTRICT MEDICAL SOCIETY

The next meeting of the Norfolk District Medical Society will be held in St. Elizabeth's Hospital, Brighton, on Tuesday evening, October 24, at 8:15.

PROGRAM

Moving Pictures of the Reconstruction of a Hand. Dr. Thomas F. Broderick.

Medicine and the Law. Dr. John J. Downing.

Case Presentations: Problems in diagnosis. Dr. William T. O'Halloran.

Endocrinology in Relation to Menstrual Disturbances. Dr. Edward L. Kickham.

FRANK CRUICKSHANK, M.D., *Secretary*.

MASSACHUSETTS ITALIAN MEDICAL SOCIETY

The regular meeting of the Massachusetts Italian Medical Society will be held at the Hotel Kenmore, Boston, on Friday evening, October 27, at 9:00. Dr. Robert Zollinger will speak on "Surgical Aspects of Peptic Ulcers: Including diagnosis and treatment" (lantern slides). A general discussion will follow.

The medical profession is cordially invited to attend.

CARL F. MARALDI, M.D., *Secretary*.

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

The October meeting of the Massachusetts Public Health Association will be held Thursday, October 26, at the University Club, Boston.

SECTION MEETINGS — 10:45 A.M.

BOARD OF HEALTH SECTION

Symposium on Health and National Defense.

Viewpoint of the Health Officer. John E. Gordon, M.D.

Viewpoint of the Public-Health Engineer. Arthur D. Weston, C.E.

Viewpoint of the Public-Health Nurse. Sophie C. Nelson, R.N.

LABORATORY SECTION

Trichinosis. Donald L. Augustine, Sc.D.

The Uses of Blood Grouping. William C. Boyd, Ph.D.

Use of Placental Blood for Transfusions (colored motion pictures). Frank E. Barton, M.D., Boston.

CHILD HEALTH SECTION

The Child: The influence of economic factors. Subject introduced by Miss Charlotte Raymond, Community Nutritionist, Newton.

Discussants: Dr. Harold W. Stevens, health officer (leader).
Miss Grace Lawrence, nurse.
Mrs. Albert Hutchinson, lay representative.
Miss Mary Spalding, nutritionist.
Miss Harriet Parsons, social worker.
Miss Mary Pfaffmann, health educator.

LUNCHEON AND MEETING — 1:00 P.M.

Implications of the War in Europe on Public Health in the United States. Frederick F. Russell, M.D.

NEW ENGLAND MEDICAL CENTER

During the week of November 6–11, a series of teaching clinics on cancer will be held at the Boston Dispensary. The schedule is as follows:

MONDAY, NOVEMBER 6.

MORNING. Symposium on Oral Cancer.

Dr. Richard H. Norton, Jr.: Oral Cancer Prophylaxis.

Dr. Kurt H. Thoma: Oral Cancer (exclusive of tongue and lip).

Dr. Roy E. Mabrey: Carcinoma of Tongue and Lip.

AFTERNOON. Symposium on Cancer of the Stomach.

Dr. Katherine S. Andrews: Diagnosis.
Dr. Jacob Schloss: Gastroscopy.
Dr. Walter E. Garrey: Peritoneoscopy.
Dr. Alice Ettinger: X-Ray.
Dr. Arthur W. Allen: Surgery.
Dr. H. Edward MacMahon: Pathology.

THURSDAY, NOVEMBER 9.

MORNING. Discussion of Carcinoma of the Large Bowel and of Gynecological Cancer.

Dr. Louis E. Phaneuf: Gynecological Cancer.
Dr. H. Edward MacMahon: Gynecological Cancer, Pathology.
Dr. William M. Shedden: Cancer of Large Bowel and Rectum (motion pictures).

AFTERNOON. Teaching Clinics on Breast and Bone Tumors.

Dr. Paul R. Hinchey: Breast Tumors.
Dr. Edward A. Cooney: Breast Cancer.
Dr. Thomas H. Peterson and Dr. John D. Adams: Bone Tumors.

FRIDAY, NOVEMBER 10.

MORNING. Clinic on Hodgkin's Disease.

Dr. William Dameshek and Dr. Isadore Olef: Hodgkin's Disease.
Dr. H. Edward MacMahon: Pathology of Hodgkin's Disease.

SATURDAY, NOVEMBER 11.

MORNING. Symposium on Intrathoracic Cancer.

Dr. Richard H. Overholt: Lung Cancer.
Dr. Reeve H. Betts: Bronchoscopy.
Dr. H. Edward MacMahon: Pathology of Intrathoracic Cancer.

These clinics are sponsored by the Massachusetts Department of Public Health. They are given without charge, but admission will be by ticket, as the number to be admitted is limited.

Luncheon may be procured at the cafeteria of the New England Medical Center.

If you plan to attend one or more of these teaching clinics, please notify: Chairman, Postgraduate Division, Tufts College Medical School, 30 Bennet Street, Boston, Mass.

ANNUAL AWARDS OF THE NEW ENGLAND SOCIETY OF PSYCHIATRY

To encourage the young medical workers in New England in the field of psychiatry to undertake scientific work and to publish the results of it, the New England Society of Psychiatry offers two awards, one of fifty dollars and one of twenty-five dollars, for the two best papers published during the calendar year of 1939. The papers shall be judged on the basis of their scientific quality by a special examining committee and the Executive Committee of the New England Society of Psychiatry.

The awards will be made and announced at the spring meeting of the New England Society of Psychiatry. Writers who have once received an award are not again eligible. Applicants should send reprints of articles or the journal in which articles appear before March 1, 1940, to the secretary, Dr. George A. Elliott (Connecticut State Hospital, Middletown, Connecticut).

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, OCTOBER 23

TUESDAY, OCTOBER 24

*9–10 a.m. Endocrine Clinic. Dr. C. H. Lawrence. Joseph H. Pratt Diagnostic Hospital.
*10 a.m.–12.30 p.m. Boston Dispensary tumor clinic.
8:15 p.m. Norfolk District Medical Society. St. Elizabeth's Hospital.
*8:15 p.m. Harvard Medical Society. Amphitheater of the Peter Bent Brigham Hospital (Shattuck Street entrance).

WEDNESDAY, OCTOBER 25

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.
*12 m. Clinicopathological conference. Children's Hospital Amphitheater.
*2 p.m. Joint medical and surgical clinic. Peter Bent Brigham Hospital.
*6 p.m. Metropolitan District Dental Society. Hotel Vendome, Boston.

THURSDAY, OCTOBER 26

*8:30 a.m. Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital, at the Children's Hospital.
*9–10 a.m. Ventricular Fibrillation as the Mechanism of Sudden Death in Patients with Coronary Occlusion. Dr. Henry Miller. Joseph H. Pratt Diagnostic Hospital.
10:45 a.m. Massachusetts Public Health Association. University Club, Boston.

FRIDAY, OCTOBER 27

*9–10 a.m. Pulmonary Embolism and Infarction. Dr. A. O. Hampton. Joseph H. Pratt Diagnostic Hospital.
*10 a.m.–12:30 p.m. Boston Dispensary tumor clinic.
*9 p.m. Massachusetts Italian Medical Society. Hotel Kenmore, Boston.

SATURDAY, OCTOBER 28

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.
*10 a.m.–12 m. Medical staff rounds of the Peter Bent Brigham Hospital. Conducted by Dr. C. Sidney Burwell.

*Open to the medical profession.

OCTOBER 20 — Boston Dispensary. Luncheon meeting of the clinical staff. Page 589, issue of October 12.

OCTOBER 23–NOVEMBER 3 — New York Academy of Medicine. Page 977, issue of June 8.

OCTOBER 24 — Harvard Medical Society. Page 632.

OCTOBER 25 — Peter Bent Brigham Hospital. Joint medical and surgical clinic. Page 632.

OCTOBER 25 — Metropolitan District Dental Society. Page 544, issue of October 5.

OCTOBER 26 — Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital. Page 632.

OCTOBER 26 — Massachusetts Public Health Association. Page 633.

OCTOBER 27 — Massachusetts Italian Medical Society. Page 633.

OCTOBER 30 — New England Heart Association. Page 589, issue of October 12.

OCTOBER 31 — Massachusetts General Hospital. Research meeting. Page 633.

NOVEMBER 6–11 — New England Medical Center. Teaching Clinics on Cancer. Page 633.

NOVEMBER 7 — Greater Boston Medical Society. Page 633.

NOVEMBER 8, 9 — New England Society of Physical Medicine, in conjunction with the Academy of Physical Medicine, Hotel Kenmore, Boston. Program to be announced.

NOVEMBER 9 — Pentucket Association of Physicians. 8:30 p.m., Hotel Bartlett, Haverhill.

DECEMBER 2 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

JANUARY 6, JUNE 8–11, 1940 — American Board of Obstetrics and Gynecology. Page 160, issue of July 27.

JANUARY 22–25, 1940 — American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

MARCH 7–9, 1940 — The New England Hospital Association. Hotel Statler, Boston.

MAY 14, 1940 — Pharmacopoeial Convention. Page 894, issue of May 25.

JUNE 7–9, 1940 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

DISTRICT MEDICAL SOCIETIES

NORFOLK

OCTOBER 24 — Page 633.

SUFFOLK

OCTOBER 25 — Page 546, issue of October 5.

NOVEMBER 2 — Censors' meeting. Page 441, issue of September 14.

NOVEMBER 29 — Scientific meeting. Treatment of Syphilis. Dr. Harold T. Hyman, Dr. Louis Chargin, and Dr. William Leifer, of New York City.

JANUARY 31, 1940 — Scientific meeting. Subject to be announced later.

MARCH 27 — Scientific meeting. Symposium on Ulcerative Colitis and Diarrheas. Under the direction of Dr. Chester M. Jones.

APRIL 24 — Annual meeting in conjunction with the Boston Medical Library. Election of officers. Program and speakers to be announced later.